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1969

COAST GUARD

RULES AND REGULATIONS

FOR

TANK VESSELS

SUBCHAPTER D

MAY 1, 1969

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CG-123

COAST GUARD

RULES AND REGULATIONS

FOR

TANK VESSELS

SUBCHAPTER D

(Title 46, C. F. R., Parts 30 to 40, Inclusive)

MAY 1, 1969

CG-123

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DEPARTMENT OF TRANSPORTATION
UNITED STATES COAST GUARD

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WASHINGTON, D.C.
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May 1, 1969

FOREWORD

All the regulations governing the inspection of merchant vessels are contained in Chapter I, Title 46 (Shipping) of the Code of Federal Regulations (46 CFR) and are applicable to certain merchant vessels which are subject to Title 52 of the Revised Statutes (secs. 4399–4500) and acts amendatory thereof or supplementary thereto.

The regulations in this pamphlet, "Rules and Regulations for Tank Vessels," CG–123, are copied from Subchapter D (Tank Vessels) of Chapter I, Title 46 CFR, and specific application is set forth in detail throughout the text. These regulations and all changes thereto have been published in various daily issues of the Federal Register prior to May 1, 1969. This pamphlet replaces the prior edition of May 2, 1966.

In applying these regulations to merchant vessels certain factors have to be considered, among which are the size of the vessel, the service in which the vessel is engaged, and the waters upon which the vessel is operated. In this regard, shipowners, operators, builders, vessels' operating personnel and other persons affected by the navigation and vessel inspection laws should familiarize themselves with the regulations contained in this pamphlet. To this end, Coast Guard personnel concerned with the administration and enforcement of these laws, namely, the Coast Guard District Commander and the Officer in Charge, Marine Inspection, who have jurisdiction over Coast Guard inspection activities in the general area of the port in which he is situated, will extend, upon request, every possible assistance.

The regulations contained in other subchapters of Chapter I of Title 46 (CFR) concerning the materiel inspection of merchant vessels are also reprinted in separate pamphlets.

W. J. Smith

W. J. Smith,
Admiral, U.S. Coast Guard,
Commandant.

Dist. (SDL No. 88)
A: None
B: cen(5); b(4); fgpq(1)
C: gmo(1)
D: irv(1)
E: mo(1)
F: kp(1)
Lists 112, 160

CONTROL SHEET FOR CHANGES

Federal Register date	Section No.	Subject

CONTROL SHEET FOR CHANGES

Federal Register date	Section No.	Subject

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THE TERMINOLOGY FOR NUMBERING

This is an explanation of the numbering system used in Coast Guard pamphlets containing regulations and is the same as that used in the Code of Federal Regulations.

The regulations in regard to merchant vessel inspection are divided into chapters, subchapters, parts, subparts, sections, paragraphs, subparagraphs, and subdivisions. The chapters are numbered with a Roman numeral and the subchapters are given alphabetical designations. The parts in this pamphlet are numbered 30 to 40, inclusive. The terminology for numbering may be described as follows:

Terminology	*Example*
Part	30
Subpart	30.01
Section	30.01–1
Paragraph	30.01–1(a)
Subparagraph	30.01–1(a)(1)
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Subchapter D—Tank Vessels[1]

PART 30—GENERAL PROVISIONS

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30.10–67 Tankship—T/ALL.
30.10–69 Tank vessel—TB/ALL.
30.10–71 Tankerman—TB/ALL.

SUBPART 30.15—EQUIVALENTS

30.15–1 Conditions under which equivalents may be used—TB/ALL.

[1] The regulations in this pamphlet are copied from the Code of Federal Regulations of the United States of America, as amended, Title 46, Chapter I.

SUBPART 30.20—ENFORCEMENT AND RIGHTS OF APPEAL

Sec.
30.20–1 Enforcement—TB/ALL.
30.20–10 Penalties for violations of tank vessel regulations—TB/ALL.
30.20–50 Right of appeal—TB/ALL.

AUTHORITY: The provisions of this Part 30 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Additional authority is cited in parentheses following the sections affected.

SUBPART 30.01—ADMINISTRATION

30.01–1 Purpose of regulations. (a) The rules and regulations in this subchapter are prescribed for all tank vessels in accordance with the intent of the various statutes administered by the Coast Guard and to provide for a correct and uniform administration of the vessel inspection requirements applicable to tank vessels.

30.01–3 Assignment of functions—TB/ALL. (a) The Department of Transportation Act (Public Law 89–670, 80 Stat. 931–950, 49 U.S.C. 1651–1659), transferred to and vested in the Secretary of Transportation "* * * all functions, powers, and duties, relating to the Coast Guard, of the Secretary of the Treasury and of other officers and offices of the Department of the Treasury" (subsection 6(b)(1), 49 U.S.C. 1655(b)). This transfer is subject to certain conditions, modifications, and exceptions as set forth in such act. By a rule in 49 CFR 1.4(a) the Secretary of Transportation delegated to the Commandant, U.S. Coast Guard, authority to exercise certain functions, powers, and duties as set forth in subsections 6(a)(4), 6(b)(1), and 6(g) of such act (49 U.S.C. 1655), subject to conditions, exceptions and modifications as described in 49 CFR Part 1. By a rule in 49 CFR 1.9 the Secretary of Transportation continued in effect actions taken prior to April 1, 1967.

(b) The Commandant, U.S. Coast Guard, in a notice dated March 31, 1967, and effective April 1, 1967 (32 F.R. 5611), approved the continuation of orders, rules, regulations, policies, procedures, privileges, waivers, and other actions, which had been made, allowed, granted, or issued prior to April 1, 1967, and provided that they shall continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority.

30.01–5 Application of regulations—TB/ALL. (a) The regulations in this subchapter con-

tain requirements for materials, design construction, inspection, manning, and operation of tank vessels, including handling and stowage of cargo and duties of officers and crew. However, vessels certificated as passenger, cargo or miscellaneous vessels, where the principal purpose or use of the vessel is not for the carriage of flammable or combustible liquid cargo in bulk, may be granted a permit to carry limited quantities of flammable or combustible liquid cargo in bulk in the grades indicated:

(1) Passenger vessels:

(i) Grade E in integral tanks or in approved portable containers of the type described in Subpart 98.35 in Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(ii) Grade D in portable containers in accordance with Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(2) Cargo vessels:

(i) Grades D and E in integral tanks or in approved portable containers in accordance with Subpart 98.35 in Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(ii) Grades A and lower in portable containers in accordance with Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(3) Miscellaneous vessels, such as cable, salvage, pile driving, and oil drilling rig vessels:

(i) Grades B and lower in fixed independent or integral tanks when specially authorized by the Commandant.

(b) The requirements of this subchapter are divided into parts as follows:

(1) Inspection and certification.

(2) Special equipment, machinery, and hull requirements.

(3) Lifesaving appliances.

(4) Firefighting equipment.

(5) Operations.

(6) Elevated temperature cargoes.

(7) Liquefied flammable gases.

(8) Flammable or combustible liquids having lethal characteristics.

(9) Special construction, arrangement, and other provisions for carrying certain flammable or combustible dangerous cargoes in bulk.

(c) The vessels and services to which each regulation applies are indicated by letters in the heading of the section or paragraph. The first letter or two letters indicate the type of vessel and the letter or letters following the oblique line indicate the waters in which such vessels may operate. These letters are described as follows:

(1) "T" signifies a tankship.

(2) "B" signifies a tank barge when it precedes an oblique line; or it signifies service on bays, sounds, and lakes other than the Great Lakes when it follows an oblique line.

(3) "ALL" signifies service on all waters.

(4) "O" signifies service on ocean waters.

(5) "C" signifies services on coastwise waters.

(6) "L" signifies service on Great Lakes' waters.

(7) "R" signifies service on river waters.

(d) This subchapter shall be applicable to all United States flag vessels indicated in Column 3 of Table 30.01–5 (d), except as follows:

(1) Any vessel operating exclusively on inland waters which are not navigable waters of the United States.

(2) Any vessel while laid up and dismantled and out of commission.

(3) With the exception of vessels of the U. S. Maritime Administration, any vessel with title vested in the United States and which is used for public purposes.

(e) This subchapter shall be applicable to all foreign flag vessels carrying combustible or flammable liquid cargo in bulk while in the navigable waters over which the United States has jurisdiction, except that:

(1) A vessel of a foreign nation signatory to the International Convention for Safety of Life at Sea, 1960, which has on board a current valid Safety Equipment Certificate; or a vessel of a foreign nation having inspection laws approximating those of the United States, together with reciprocal inspection arrangements with the United States and which has on board a current valid Certificate of Inspection issued by its government under such arrangements; in either case, shall be subject only to the requirements of Section 35.01–1 of Subpart 35.01, and the safety and cargo handling requirements in Subparts 35.30 and 35.35.

(f) Notwithstanding the exceptions previously noted in paragraph (e) of this section, foreign vessels of novel design or construction, or whose operation involves potential unusual risks, shall be subject to inspection to the extent necessary to safeguard life and property in United States ports, as further provided by Section 2.01–13 of Subchapter A (Procedures applicable to the Public) of this chapter.

30.01–6 Application of regulations to tankships on an international voyage—T/ALL.

(a) Where, in various places or portions of this subchapter, requirements are stipulated specifically for "tankships on an international voyage," it is intended that these requirements apply only to tankships subject to the International Convention for Safety of Life at Sea, 1960, which are mechanically propelled tankships of 500 gross tons and over on an international voyage, as defined in Section 30.10-36.

(b) In accordance with Regulation 4, Chapter I (General Provisions), of the International Convention for Safety of Life at Sea, 1960, a tankship which is not normally engaged on an international voyage but which in exceptional circumstances, is required to undertake a single international voyage, may be exempted by the Commandant from any of the requirements of the

TABLE 30.01—5(d)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]: Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4 5] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 5]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 3 6 7 8]	Vessels subject to provisions of Subchapter U—Oceanographic Vessels [2 5 6 7 9]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Steam	Vessels not over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	All tugboats and towboats.	All vessels except those covered by columns 3, 4, 5, and 7.	None.
	Vessels over 65 feet in length.	All vessels carrying combustible or flammable liquid cargo in bulk.[5]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels of not over 15 gross tons which carry more than 6 passengers.[7] 3. All other vessels carrying passengers,[7] except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew. c. Towing and fishing vessels, in other than ocean and coastwise service, may carry persons on the legitimate business of the vessel, in addition to crew, but not to exceed one for each net ton of the vessel.	All vessels except those covered by columns 3 and 4.	None	All vessels engaged in oceanographic research.
Motor	Vessels not over 15 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All vessels except those covered by columns 3, 4, 5, and 7.	None.
	Vessels over 15 gross tons except seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[5]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All vessels not over 65 feet in length which carry more than 6 passengers.[7] 3. All other vessels of over 65 feet in length carrying passengers for hire except documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels carrying freight for hire except those covered by columns 3 and 4.	All vessels except those covered by columns 3, 4, 5, and 7.	None.
	Seagoing motor vessels of 300 gross tons and over.	All vessels carrying combustible or flammable liquid cargo in bulk.[5]	1. All vessels carrying more than 12 passengers on an international voyage, except yachts. 2. All other vessels carrying passengers,[7] except: a. Yachts. b. Documented cargo or tank vessels issued a permit to carry not more than 16 persons in addition to the crew.	All vessels except those covered by columns 3 and 4, and those engaged in the fishing, oystering, clamming, crabbing, or any other branch of the fishery, kelp, or sponge industry.	All vessels except those covered by columns 3, 4, 5, and 7.	All vessels engaged in oceanographic research.
Sail	Vessels not over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None	None.
	Vessels over 700 gross tons.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	None	None.

See footnotes at end of table.

TABLE 30.01—5(d) (continued)

Method of propulsion	Size or other limitations [1]	Classes of vessels (including motorboats) examined or inspected under various Coast Guard regulations [1]				
		Vessels inspected and certificated under Subchapter D—Tank Vessels [2]	Vessels inspected and certificated under either Subchapter H—Passenger Vessels [2 3 4 5] or Subchapter T—Small Passenger Vessels [2 3 4]	Vessels inspected and certificated under Subchapter I—Cargo and Miscellaneous Vessels [2 3]	Vessels subject to provisions of Subchapter C—Uninspected Vessels [2 3 6 7 8]	Vessels subject to provisions of Subchapter U—Oceanographic Vessels [2 5 6 7 9]
Column 1	Column 2	Column 3	Column 4	Column 5	Column 6	Column 7
Non-self-propelled.	Vessels less than 100 gross tons.	All vessels carrying combustible or liquid cargo in bulk.	All vessels carrying more than 6 passengers.[7]	Those vessels carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by column 4.	None.
	Vessels 100 gross tons or over.	All vessels carrying combustible or flammable liquid cargo in bulk.	All vessels carrying passengers for hire.	All seagoing barges except those covered by columns 3 and 4; and those inland barges carrying dangerous cargoes when required by 46 CFR Part 98 or 146.	All barges carrying passengers except those covered by columns 4 and 7.	All seagoing barges engaged in oceanographic research.

[1] Where length is used in this table it means the length measured from end to end over the deck, excluding sheer. This expression means a straight line measurement of the overall length from the foremost part of the vessel to the aftermost part of the vessel, measured parallel to the centerline.

[2] Subchapters E (Load Lines), F (Marine Engineering), J (Electrieal Engineering), and N (Dangerous Cargoes) of this chapter may also be applicable under certain conditions. The provisions of 46 U.S.C. 170 and Subchapter N (Dangerous Cargoes) of this chapter apply whenever explosives or dangerous articles or substances are on board vessels (including motorboats), except when specifically excmpted by law.

[3] Public nautical schoolships, other than vessels of the Navy and Coast Guard, shall meet the requirements of Part 167 of Subchapter R (Nautical Schools) of this chapter. Civilian nautical schoolships, as defined by 46 U.S.C. 1331, shall meet the requirements of Subchapter H (Passenger Vessels) and Part 168 of Subchapter R (Nautical Schools) of this chapter.

[4] Subchapter H (Passenger Vessels) of this chapter covers only those vessels of 100 gross tons or more. Subchapter T (Small Passenger Vessels) of this chapter covers only those vessels of less than 100 gross tons.

[5] Vessels covered by Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter, where the principal purpose or use of the vessel is not for the carriage of liquid cargo, may be granted a permit to carry a limited amount of flammable or combustible liquid cargo in bulk. The portion of the vessel used for the carriage of the flammable or combustible liquid cargo shall meet the requirements of Subchapter D (Tank Vessels) in addition to the requirements of Subchapter H (Passenger Vessels) or I (Cargo and Miscellaneous Vessels) of this chapter.

[6] Any vessel on an international voyage is subject to the requirements of the International Convention for Safety of Life at Sea, 1960.

[7] The meaning of the term "passenger" is as defined in the Act of May 10, 1956 (Sec. 1, 70 Stat. 151; 46 U.S.C. 390). On oceanographic vessels scientific personnel on board shall not be deemed to be passengers nor seamen, but for calculations of lifesaving equipment, etc., shall be counted as persons.

[8] Boilers and machinery are subject to examination on vessels over 40 feet in length.

[9] Under 46 U.S.C. 441 an "oceanographic research vessel" is a vessel "* * * being employed exclusively in instruction in oceanography or limnology, or both, or exclusively in oceanographic research, * * *." Under 46 U.S.C. 443, "an oceanographic research vessel shall not be deemed to be engaged in trade or commerce." If or when an oceanographic vessel engages in trade or commerce, such vessel cannot operate under its certificate of inspection as an oceanographic vessel, but shall be inspected and certificated for the service in which engaged, and the scientific personnel aboard then become persons employed in the business of the vessel.

regulations of this Convention: *Provided*, That it complies with safety requirements which are adequate, in his opinion, for the voyage which is to be undertaken.

(c) In accordance with Regulation 1(c), Chapter II (Construction), of the International Convention for Safety of Life at Sea, 1960, the Commandant may, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of any specific requirements of Chapter II of this Convention unreasonable or unnecessary, exempt from those requirements individual tankships or classes of tankships, which in the course of their voyage do not proceed more than 20 miles from the nearest land.

(d) In accordance with Regulation 3(a), Chapter III (Lifesaving Appliances, etc.), of the International Convention for Safety of Life at Sea, 1960, the Commandant, if he considers that the sheltered nature and conditions of the voyage are such as to render the application of the full requirements of Chapter III of this Convention unreasonable or unnecessary, may to that extent exempt from the requirements of Chapter III individual tankships or classes of tankships which, in the course of their voyage, do not go more than 20 miles from the nearest land.

30.01–7 Ocean or unlimited coastwise vessels on inland and Great Lakes Routes—TB/OC. (a) Vessels inspected and certificated for ocean or unlimited coastwise routes shall be considered suitable for navigation insofar as the provisions of this subchapter are concerned on any inland route, including the Great Lakes.

30.01–10 Application of regulations governing alterations or repairs—TB/ALL. When major alterations or major repairs of tank vessels become necessary the work shall be done under the direction of the Officer in Charge, Marine Inspection, and shall be in accordance with the regulations in effect for new construction insofar as possible. When minor alterations or minor repairs of tank vessels become necessary such work shall be under the direction of the Officer in Charge, Marine Inspection, and shall be in accordance with the regulations in effect at the time the vessel was contracted for or built, or in accordance with the regulations in effect for new construction insofar as possible.

30.01–15 Effective date of regulations—TB/ALL. (a) The regulations in this subchapter are effective on and after November 10, 1936: *Provided*, That amendments, revisions, or additions shall become effective ninety (90) days after the date of publication in the Federal Register unless the Commandant shall fix a different time.

(b) The regulations in this subchapter are not retroactive in effect unless specifically made so at the time the regulations are issued. Changes in specification requirements of articles of equipment, or materials used in construction of tank vessels, shall not apply to such items which have been passed as satisfactory until replacement shall become necessary, unless a specific finding is made that such equipment or material used is unsafe or hazardous and has to be removed from tank vessels.

30.01–20 Portable containers—interpretive rulings—TB/ALL. (a) The phrase "drums, barrels, or other packages," as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to mean portable containers having a maximum capacity of 110 U.S. gallons and ICC specification cylinders having a water capacity of not more than 1,000 pounds, which are actually loaded and discharged from vessels with their contents intact.

(b) The phrase "inflammable or combustible liquid cargo in bulk" as used in R.S. 4417a, as amended (46 U.S.C. 391a), and in R.S. 4472, as amended (46 U.S.C. 170), is interpreted to include such cargo in portable containers of a capacity of more than 110 U.S. gallons.

(c) The phrase "liquid cargo" as used in R.S. 4417a, as amended (46 U.S.C. 391a), is interpreted to mean flammable or combustible liquids.

(Interpret or apply R.S. 4472, as amended; 46 U.S.C. 170)

30.01–25 Application to vessels concerning nuclear energy—TB/ALL. (a) Pertinent definitions are in Section 30.10–44.

(b) Special provisions for "nuclear vessels" are in Part 37 of this subchapter.

(c) The regulations covering the transportation and handling of radioactive materials as cargo are in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

(d) The regulations covering pressure containing portions of nuclear vessel systems are in Part 55 of Subchapter F (Marine Engineering) of this chapter. See Section 56.04–20 of Subchapter F (Marine Engineering) of this chapter for nuclear piping. See Subpart 61.25 of Subchapter F (Marine Engineering) of this chapter for requirements regarding periodic tests and inspections of nuclear reactor power plants.

SUBPART 30.10—DEFINITIONS

30.10–1 Definition of terms—TB/ALL. Certain terms used in the regulations in this subchapter are defined in this subpart.

30.10–3 Approved—TB/ALL. The term "approved" means approved by the Commandant unless otherwise stated.

30.10–5 Cargo—TB/ALL. The term "cargo" means combustible liquid, flammable liquid, or liquefied flammable gas unless otherwise stated.

30.10–6 Cargo handling room—TB/ALL. The term "cargo handling room" means any enclosed space where cargo is pumped, compressed, or processed. Examples of "cargo handling rooms" are pump rooms, compressor rooms, and cargo valve rooms.

30.10–7 Certificated—TB/ALL. The term "certificated" when applied to tank vessels refers to a vessel covered by a certificate of inspection issued by the Coast Guard; when applied to men employed on tank vessels, the term refers to a certificate of ability issued by the Coast Guard.

30.10–9 Classification requirements—TB/ALL. The term "classification requirements" means applicable rules and supplementary requirements of the American Bureau of Shipping, or other recognized classification society.

30.10–11 Coastwise—TB/C. Under this designation shall be included all tank vessels normally navigating the waters of any ocean or the Gulf of Mexico 20 nautical miles or less offshore.

30.10–13 Cofferdam — TB/ALL. The term "cofferdam" means a void or empty space separating two or more compartments for the purpose of isolation or to prevent the contents of one compartment from entering another in the event of the failure of the walls of one to retain their tightness.

30.10–15 Combustible liquid—TB/ALL. The term "combustible liquid" means any liquid having a flashpoint above 80° F. (as determined from an open-cup tester, as used for test of burning oils). Combustible liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in Sections 146.25–10 and 146.25–15 of Subchapter N (Dangerous Cargoes) of this chapter. In the regulations of this subchapter, combustible liquids are referred to by grades, as follows:

(a) Grade D. Any combustible liquid having a flashpoint below 150° F. and above 80° F.

(b) Grade E. Any combustible liquid having a flashpoint of 150° F. or above.

30.10–17 Commandant—TB/ALL. The term "Commandant" means the Commandant of the Coast Guard.

30.10–19 Coast Guard District Commander—TB/ALL. The term "Coast Guard District

Commander" means an officer of the Coast Guard designated as such by the Commandant to command all Coast Guard activities within his district which include the enforcement and administration of Title 52, R. S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder and the inspections required thereby.

30.10–21 Flammable or inflammable—TB/ALL. The words "flammable" and "inflammable" are interchangeable or synonymous terms for the purpose of the regulations in this subchapter.

30.10–22 Flammable liquid—TB/ALL. The term "flammable liquid" means any liquid which gives off flammable vapors (as determined by flashpoint from an open-cup tester, as used for test of burning oils) at or below a temperature of 80° F. Flammable liquids having lethal qualities are those having the characteristics of class "B" or "C" poisons as defined in Sections 146.25–10 and 146.25–15, of Subchapter N (Dangerous Cargoes) of this chapter. Flammable liquids are referred to by grades as follows:

(a) Grade A. Any flammable liquid having a Reid [1] vapor pressure of 14 pounds or more.

(b) Grade B. Any flammable liquid having a Reid [1] vapor pressure under 14 pounds and over 8½ pounds.

(c) Grade C. Any flammable liquid having a Reid [1] vapor pressure of 8½ pounds or less and a flashpoint of 80° F. or below.

30.10–23 Flame arrester—TB/ALL. The term "flame arrester" means any device or assembly of a cellular, tubular, pressure, or other type used for preventing the passage of flames into enclosed spaces.

30.10–25 Flame screen—TB/ALL. The term "flame screen" means a fitted single screen of corrosion-resistant wire of at least 30 by 30 mesh, or two fitted screens, both of corrosion-resistant wire, of at least 20 by 20 mesh, spaced not less than ½ inch or more than 1½ inches apart.

30.10–27 Flashpoint—TB/ALL. The term "flashpoint" indicates the temperature in degrees Fahrenheit at which a liquid gives off a flammable vapor when heated in an open-cup tester. For the purpose of the regulations in this subchapter, flashpoints determined by other testing methods will be equivalent to those determined with an open-cup tester, as follows:

TABLE 30.10–27 EQUIVALENT FLASHPOINTS

Open-cup tester	Tag closed-cup tester (A. S. T. M.)	Pensky-Martens closed tester (A. S. T. M.)
° F.	° F.	° F.
80	75	
150		140

[1] American Society for Testing Materials Standard D–323 (most recent revision): Method of Test for Vapor Pressure of Petroleum Products (Reid Method)

30.10–29 Gas free—TB/ALL. The term "gas free" means free from dangerous concentrations of flammable or toxic gases.

30.10–31 General rules and regulations—TB/ALL. The term "general rules and regulations" means the requirements contained in this chapter.

30.10–33 Great Lakes—TB/L. Under this designation shall be included all tank vessels navigating the Great Lakes.

30.10–35 Headquarters — TB/ALL. The term "Headquarters" means the Office of the Commandant, U.S. Coast Guard, Washington, D.C., 20591.

30.10–36 International voyage—TB/ALL. (a) The term "international voyage," as used in this subchapter, shall have the same meaning as that contained in Regulation 2(d), Chapter I, of the International Convention for Safety of Life at Sea, 1960; i.e., " 'International voyage' means a voyage from a country to which the present Convention applies to a port outside such country, or conversely; and for this purpose every territory for the international relations of which a Contracting Government is responsible or for which the United Nations is the administering authority is regarded as a separate country."

(b) The International Convention for Safety of Life at Sea, 1960, does not apply to tank vessels "solely navigating the Great Lakes of North America and the River St. Lawrence as far east as a straight line drawn from Cap de Rosiers to West Point, Anticosti Island and, on the north side of Anticosti Island, the 63d Meridian." Accordingly, such tank vessels shall not be considered as being on an "international voyage" for the purposes of this subchapter.

(c) For the purposes of this subchapter the term "territory" as used in paragraph (a) of this section shall be considered to include the Commonwealth of Puerto Rico, the Canal Zone, all possessions of the United States, and all lands held by the United States under a protectorate or mandate.

(d) Although voyages between the continental United States and Hawaii or Alaska, and voyages between Hawaii and Alaska are not "international voyages" under the provisions of the International Convention for Safety of Life at Sea, 1960, such voyages are similar in nature and shall be considered as "international voyages" and subject to the same requirements for the purposes of this subchapter.

30.10–39 Liquefied flammable gas—TB/ALL. The term "liquefied flammable gas" means any flammable gas having a Reid vapor pressure exceeding 40 pounds, which has been liquefied.

30.10–41 Lakes, bays, and sounds—TB/B. Under this designation shall be included all tank vessels navigating the waters of any of the lakes, bays, or sounds other than the waters of the Great Lakes.

30.10–43 Marine inspector or inspector—TB/ALL. The terms "marine inspector" or "inspector" mean any person from the civilian or military branch of the Coast Guard assigned under the superintendence and direction of an Officer in Charge, Marine Inspection, or any other person as may be designated for the performance of duties with respect to the enforcement and administration of Title 52, R. S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspections required thereby.

30.10–44 Nuclear energy, radioactive material, and nuclear vessel—TB/ALL. (a) The term "nuclear energy" means all forms of energy released by nuclear fission or radioactive decay, or by any other form of nuclear transformation.

(b) The term "radioactive material" means any material or combination of materials that spontaneously emits ionizing radiation.

(c) The term "nuclear vessel" means any vessel in which power for propulsion, or for any other purpose, is derived from nuclear energy; or any vessel handling or processing substantial amounts of radioactive material other than as cargo.

30.10–45 Ocean—TB/O. Under this designation shall be included all tank vessels normally navigating the waters of any ocean or the Gulf of Mexico more than 20 nautical miles offshore.

30.10–47 Officer in Charge, Marine Inspection—TB/ALL. The term "Officer in Charge, Marine Inspection," means any person from the civilian or military branch of the Coast Guard designated as such by the Commandant and who under the superintendence and direction of the Coast Guard District Commander is in charge of an inspection zone for the performance of duties with respect to the enforcement and administration of Title 52, R. S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder and the inspections required thereby.

30.10–49 Permit—TB/ALL. The term "permit" refers to endorsement on the certificate of inspection, authorizing the presence on board of liquid flammable or combustible cargoes in bulk, issued by an Officer in Charge, Marine Inspection, for a tank vessel which is found to be in substantial compliance with the regulations in this subchapter.

30.10–55 Pressure vacuum relief valve—TB ALL. The term "pressure vacuum relief valve" means any device or assembly of a mechanical, liquid, weight, or other type used for the automatic regulation of pressure or vacuum in enclosed places.

30.10–57 Recognized classification society—TB/ALL. The term "recognized classification society" means the American Bureau of Shipping or other classification society recognized by the Commandant.

30.10–59 Reid vapor pressure—TB/ALL. The term "Reid vapor pressure" means the vapor pressure of a liquid at a temperature of 100° F. expressed in pounds per square inch absolute, as determined by the "Reid Method" as described in the American Society for Testing Materials Standard D–323 (most recent revision), Method of Test for Vapor Pressure of Petroleum Products. This Standard is available at Headquarters for reading purposes or it may be purchased from the Society at 1916 Race Street, Philadelphia, Pa., 19103.

30.10–61 Rivers—TB/R. Under this designation shall be included all tank vessels whose navigation is restricted to rivers and/or to canals, exclusively.

30.10–62 Rules of the Road—TB/ALL. (a) The term "Rules of the Road" means the statutory and regulatory rules governing navigation of vessels. These rules are also published by the Coast Guard in pamphlet form as follows:

(1) Rules of the Road—International—Inland (CG–169).

(2) Rules of the Road—Great Lakes (CG–172).

(3) Rules of the Road—Western Rivers (CG–184).

(b) The current editions of the "Rules of the Road" pamphlets may be obtained from any Marine Inspection Office.

30.10–63 Spark arrester—TB/ALL. The term "spark arrester" means any device, assembly, or method of a mechanical, centrifugal, cooling, or other type and of a size suitable for the retention or quenching of sparks in exhaust pipes from internal combustion engines.

30.10–65 Tank barge—B/ALL. The term "tank barge" means any tank vessel not equipped with means of self-propulsion.

30.10–67 Tankship—T/ALL. The term "tankship" means any tank vessel propelled by power or sail.

30.10–69 Tank vessel—TB/ALL. The term "tank vessel" means any vessel especially constructed or converted to carry liquid bulk cargo in tanks.

30.10–71 Tankerman—TB/ALL. The term "tankerman" means any person holding a certificate issued by the Coast Guard attesting to his competency in the handling of flammable or combustible liquid cargo in bulk or is any person holding a valid license as master, mate, pilot, or engineer.

SUBPART 30.15—EQUIVALENTS

30.15-1 Conditions under which equivalents may be used—TB/ALL. (a) Where in this subchapter it is provided that a particular fitting, material, appliance, apparatus, or equipment, or type thereof, shall be fitted or carried in a vessel, or that any particular provision shall be made or arrangement shall be adopted, the Commandant may accept in substitution therefor any other fitting, material, apparatus, or equipment, or type thereof, or any other arrangement: *Provided*, That he shall have been satisfied by suitable trials that the fitting, material, appliance, apparatus, or equipment, or type thereof, or the provision or arrangement is at least as effective as that specified in this subchapter.

(b) In any case where it is shown to the satisfaction of the Commandant that the use of any particular equipment, apparatus, or arrangement not specifically required by law is unreasonable or impracticable, the Commandant may permit the use of alternate equipment, apparatus, or arrangement to such an extent and upon such conditions as will insure, to his satisfaction, a degree of safety consistent with the minimum standards set forth in this subchapter.

SUBPART 30.20—ENFORCEMENT AND RIGHTS OF APPEAL

30.20-1 Enforcement—TB/ALL. The Officer in Charge, Marine Inspection, under the superintendence of the Coast Guard District Commander, is responsible for the performance of duties within his jurisdiction with respect to the enforcement and administration of Title 52, R. S., acts amendatory thereof or supplemental thereto, rules and regulations thereunder, and the inspections required thereby.

30.20-10 Penalties for violations of tank vessel regulations—TB/ALL. (a) The provisions of R. S. 4417a, as amended (46 U. S. C. 391a) provide the following penalty:

(7) The owner, master, or person in charge of any vessel subject to the provisions in this section, or any or all of them, who shall violate the provisions of this section, or of the rules and regulations established hereunder, shall be subject to a fine of not more than $1,000 or imprisonment for not more than one year, or both such fine and penalty.

(b) Certificates of inspection for tank vessels may also be revoked or suspended by the Coast Guard where such process is authorized by law. This may occur if the vessel does not meet the requirements of law or regulations in this chapter or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

30.20-50 Right of appeal—TB/ALL. Whenever any person directly interested in or affected by any decision or action of any Officer in Charge, Marine Inspection, shall feel aggrieved by such decision or action, he may appeal therefrom to the Coast Guard District Commander having jurisdiction and a like appeal shall be allowed from any decision or action of the Coast Guard District Commander to the Commandant, whose decision shall be final: *Provided*, *however*, That application for such reexamination of the case by a Coast Guard District Commander or by the Commandant shall be made within 30 days after the decision or action appealed from shall have been rendered or taken.

(R.S. 4453, as amended; 46 U.S.C. 435)

PART 31—INSPECTION AND CERTIFICATION

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Sec.

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31.40-25 Exemption Certificate—T/ALL.
31.40-30 Nuclear Cargo Ship Safety Certificate—T/ALL.
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AUTHORITY: The provisions of this Part 31 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Interpret or apply sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Additional authority is cited in parentheses following the sections affected.

SUBPART 31.01—GENERAL

31.01-1 Inspections required—TB/ALL.

(a) Every tank vessel subject to the regulations in this subchapter shall be inspected biennially, or

annually, or oftener, if necessary, by the Coast Guard to see that the hull, boilers, machinery, equipment, apparatus for storage, and appliances of the vessel comply with the marine inspection laws, and the regulations in this subchapter, and Subchapter E (Load Lines), Subchapter F (Marine Engineering), Subchapter J (Electrical Engineering), and Subchapter Q (Specifications) of this chapter where applicable.

(b) Tank vessels while laid up and dismantled and out of commission are exempt from any or all inspections required by law or regulations in this subchapter.

(c) For inspection and tests of tanks containing certain dangerous cargoes in bulk, see Part 98 of Subchapter I (Cargo and Miscellaneous Vessels) of this chapter.

(R.S. 4418, as amended, 4433, as amended, 4472, as amended, 4488, as amended; 46 U.S.C. 392, 411, 170, 481)

31.01-5 Scope of initial inspection—TB/ALL. (a) The initial inspection, which may consist of a series of inspections during the construction of a vessel, shall include a complete inspection of the structure, including the outside of the vessel's bottom, the machinery, unfired pressure vessels, equipment and the inside and outside of the boilers. The inspection shall be such as to insure that the arrangements, material, and scantlings of the structure, boilers and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, lifesaving appliances, fire-detecting and extinguishing equipment, pilot ladders and other equipment fully comply with the applicable regulations for such vessel and are in accordance with approved plans, and determine that the vessel is in possession of a valid certificate issued by the Federal Communications Commission, if any. The inspection shall also be such as to insure that the workmanship of all parts of the vessel and its equipment is in all respects satisfactory and that the vessel is provided with lights, and means of making sound signals and distress signals as required by applicable regulations and the applicable Rules of the Road.

(b) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. In addition, the inspection shall include any special preoperational tests and inspections prescribed in the Atomic Energy Commission operating license, by the nuclear plant operating procedures, or by the vessel's Safety Assessment.

31.01-10 Authority of marine inspectors—TB/ALL. Inspectors may at any time lawfully inspect any tank vessel.

31.01-15 Application for inspection—TB/ALL. (a) Application in writing for the inspection incident to the issuance or reissuance of a certificate of inspection to every tank vessel required to be inspected by law and the regulations in this subchapter shall be made by the master, owner, or agent to the Officer in Charge, Marine Inspection, at any local marine inspection office, U.S. Coast Guard, where the vessel may be operated.

(b) The application should be on Form CG-3752, Application for Inspection of U.S. Vessel, which requires information on name and type of vessel, nature of employment and route in which to be operated, grade or type of cargo to be carried, place where and date when the vessel may be inspected, and that no other application has been made to any Officer in Charge, Marine Inspection, since the issuance of the last valid certificate of inspection.

31.01-20 Application for inspection of new tank vessel or conversion of a vessel to a tank vessel—TB/ALL. Prior to the commencement of the construction of any new tank vessel, or prior to the commencement of the conversion of any vessel to a tank vessel, application for the approval of contract plans and specifications and for a certificate of inspection shall be made in writing to the Coast Guard and no such construction or conversion shall be proceeded with until such approval is granted. (See Section 31.10-1.)

SUBPART 31.05—CERTIFICATES OF INSPECTION

31.05-1 Issuance of certificate of inspection—TB/ALL. (a) When a tank vessel is found to comply with law and the regulations in this subchapter, and Subchapter E (Load Lines), Subchapter F (Marine Engineering), Subchapter J (Electrical Engineering), and Subchapter Q (Specifications) of this chapter, a certificate of inspection shall be issued to it, or to its owners, by the Officer in Charge, Marine Inspection.

(b) Certificates of inspection for tank vessels shall be similar in form to certificates issued to other cargo vessels, and in addition to the manning requirements and waters over which they may be operated, they shall be appropriately endorsed "Inspected and approved for the carriage of flammable or combustible liquids of Grade A, B, C, D, or E" (as the case may be), and such endorsement shall serve as a permit for such vessel to operate. The endorsement for the carriage of liquefied flammable gases is set forth in Section 38.01-5 of this subchapter. The endorsement for the carriage of Class "B" or "C" poisonous liquids is set forth in Section 39.01-5 of this subchapter.

(c) The certificate of inspection shall be delivered to the master or owner of the tank vessel to which it relates.

31.05-5 Posting the certificate of inspection—TB/ALL. The certificate of inspection shall be framed under glass and posted in a conspicuous part of the vessel, except that where it is not practicable to so expose the certificate of inspection it shall be carried in the vessel in such

manner as authorized by the Officer in Charge, Marine Inspection.

31.05–10 Period of validity of certificate of inspection—TB/ALL. (a) Certificates of inspection will be issued for periods of either 1 or 2 years. For nuclear vessels it shall be for a period of 1 year: see also Section 37.10–1 of this subchapter.

(b) Application may be made by the master, owner, or agent for inspection and issuance of a new certificate of inspection at any time during the period of validity of the current certificate. For nuclear vessels see Part 37 of this subchapter.

(c) Certificates of inspection may be revoked or suspended by the Coast Guard where such process is authorized by law. This may occur if the vessel does not meet the requirements of law or regulations in this chapter or if there is a failure to maintain the safety requirements requisite to the issuance of a certificate of inspection.

31.05–15 Certificate of inspection; terms; endorsements—TB/ALL. The terms, endorsements and conditions set forth on a certificate of inspection shall have the same force and effect as the regulations contained in this subchapter.

SUBPART 31.10—INSPECTIONS

31.10–1 Recognized classification society—TB/ALL. (a) In the inspection of hulls, boilers, and machinery, the current standards established by the American Bureau of Shipping and designated "Rules for Building and Classing Steel Vessels" respecting material and construction of hulls, boilers, and machinery, except as otherwise provided for by law and regulations in this chapter, shall be accepted as standard by the Coast Guard.

(b) The current standards established by the American Bureau of Shipping in effect at the time of construction of the vessel, or otherwise as applicable, shall be used. The book "Rules for Building and Classing Steel Vessels" is usually published annually and may be purchased from the American Bureau of Shipping, 45 Broad Street, New York, N.Y., 10004. These standards may be also examined at the office of the Commandant (M), U.S. Coast Guard, Washington, D.C., 20591, or at the office of any Coast Guard District Commander or Officer in Charge, Marine Inspection.

(c) The approved plans and certificate of the American Bureau of Shipping, or other recognized classification society for classed vessels, may be accepted by the Coast Guard as evidence of the structural efficiency of the hull and reliability of machinery of vessels subject to the regulations in this subchapter, except as otherwise provided for by laws and regulations in this chapter.

31.10–5 Inspection of new tank vessels—TB/ALL—(a) Plans. Triplicate copies of contract plans and specifications shall be forwarded to the Officer in Charge, Marine Inspection, in whose district the construction will take place, for submission to Headquarters for approval, but if the tank vessel is to be classed, such plans and specifications shall first be approved by a recognized classification society. If the plans and specifications are found to be in substantial agreement with the regulations in this chapter, they shall be approved, properly stamped and dated and distributed as follows: one set to owner or builder; one set to Officer in Charge, Marine Inspection, of the district in which the vessel is to be built; and one set shall be retained at Headquarters. If such plans and specifications are not approved, Headquarters shall notify the owner or builder promptly wherein they fail to comply with the regulations in this chapter. For list of electrical plans see Section 111.05–5 of Subchapter J (Electrical Engineering) of this chapter.

(1) The plans and specifications shall include the arrangement of the cargo gear. The principal details of the gear and the safe working load for each component part shall be shown. (See Section 31.10–16 and Subpart 31.37 for applicable requirements.)

(b) Inspection. During construction, and upon completion of each tank vessel, it shall be inspected by the Officer in Charge, Marine Inspection, to determine whether it has been built in accordance with the approved plans and specifications, and, if so, a certificate of inspection endorsed as a permit for the carriage of flammable or combustible liquids in bulk for the proper grade or grades of cargo shall be issued to the vessel or its owner.

(c) Certificate of class may be accepted. In the event such tank vessel is classed by the American Bureau of Shipping or other recognized classification society, the approved plans and certificates of such society may be accepted by the Coast Guard as evidence of the structural efficiency of the hull and reliability of machinery, except as otherwise provided for by law and the rules and regulations in this subchapter.

31.10–10 Vessels converted to tank vessels—TB/ALL. The procedure for the inspection of vessels converted to tank vessels shall conform to the inspection for new tank vessels as called for in Paragraph 31.10–5 (b), and such vessels shall comply with the requirements of inspections for converted vessels as set forth in the regulations in this subchapter.

31.10–15 Inspection for certification—TB/ALL. (a) The Officer in Charge, Marine Inspection, shall once in every 2 years, at least, and in the case of nuclear vessels, at least once every year carefully inspect such tank vessel within his jurisdiction and shall satisfy himself that every such vessel so inspected is of a structure suitable for the carriage of flammable and/or combustible liquids in bulk and for the proper grade or grades of such

cargo in the service in which she is employed. If the Officer in Charge, Marine Inspection, deems it expedient, he may direct the vessel to be put in motion, and may adopt any other suitable means to test her sufficiency and that of her equipment.

(b) The inspection for certification shall include an inspection of the structure, boilers, and other pressure vessels, machinery and equipment. The inspection shall be such as to insure that the vessel, as regards the structure, boilers, and other pressure vessels and their appurtenances, piping, main and auxiliary machinery, electrical installations, life-saving appliances, fire-detecting and extinguishing equipment, pilot ladders, and other equipment is in satisfactory condition and fit for the service for which it is intended, and that it complies with the applicable regulations for such vessels, and determine that the vessel is in possession of a valid certificate issued by the Federal Communications Commission, if required. The lights and means of making sound signals and the distress signals carried by the vessel shall also be subject to the above mentioned inspection for certification for the purpose of insuring that they comply with the requirements of the applicable regulations and of the applicable Rules of the Road.

(c) For nuclear vessels, the inspections required by this section shall be made except insofar as they may be limited by the presence of radiation. See also Subpart 37.10 of this subchapter.

31.10–16 Inspection and certification of cargo gear—TB/ALL. (a) An inspection of the cargo gear shall be required. The inspection may consist of tests and examinations to determine the condition and suitability of the cargo gear. Current valid certificates and registers of cargo gear, issued by recognized nonprofit organizations or associations approved by the Commandant may be accepted as prima facie evidence of the condition and suitability of the cargo gear. Cargo gear certificates and registers will not be issued by the Coast Guard.

(b) Every acceptable cargo gear certificate and/or register shall be properly executed by a person authorized to do so and shall:

(1) Certify as to the tests and examinations conducted;

(2) Show the dates on which the tests and examinations were conducted; and

(3) Indicate that the cargo gear therein described complies with standards equal to or exceeding those set forth in Subpart 31.37.

(c) Competent persons for the purposes of this section and Subpart 31.37 are:

(1) Coast Guard marine inspectors;

(2) Surveyors of the organizations or associations approved by the Commandant;

(3) Such other persons as are authorized by the regulations in Subpart 31.37 as may be required; and,

(4) Responsible officials or employees of the testing laboratories, companies, or organizations who conduct tests of pieces of loose cargo gear, wire rope, or the annealing of gear as may be required.

(d) The registers issued in connection with cargo gear certification must have all required entries fully completed as of the dates indicated, shall be kept current, and shall include the following:

(1) A register of the cargo handling machinery and the gear accessory thereto carried on the vessel named therein;

(2) Certification of the testing and examination of winches, derricks, and their accessory gear;

(3) Certification of the testing and examination of cranes, hoists, and their accessory gear;

(4) Certification of the testing and examination of chains, rings, hooks, shackles, swivels, and blocks;

(5) Certification of the testing and examination of wire rope;

(6) Certification of the heat treatment of chains, rings, hooks, shackles, and swivels which require such treatment; and,

(7) Certification of the annual thorough examinations of gear not required to be periodically heat treated.

(e) It is the responsibility of the master to have a ship's officer inspect cargo gear when required by Subpart 31.37. For those inspected vessels which do not have valid cargo gear certificates and registers as provided by this section, such vessels will be required to have their shipboard cargo gear undergo tests and inspections in accordance with the provisions of Subpart 31.37.

31.10–17 Reinspection — TB/ALL. (a) At least one reinspection shall be made on each vessel holding a certificate of inspection valid for two years. This reinspection will be made, where possible, between the tenth and fourteenth month of the period for which the certificate is valid. No written application for reinspection will be required.

(b) The inspector shall examine all accessible parts of the vessel's hull, machinery, and equipment to be assured that it is in a satisfactory condition.

(c) In general, the scope of the reinspection shall be the same as for the inspection for certification, but will be in less detail unless it is determined that a major change has occurred since the last inspection.

(d) Nothing in this subpart shall be construed as limiting the inspector from making such tests or inspections as he deems necessary to be assured of the seaworthiness of the vessel.

(e) If the reinspection reveals deficiencies in the maintenance as called for by the regulations in this subchapter, such necessary repairs or improvements shall be made as may be ordered.

31.10–18 Firefighting equipment: General—TB/ALL. (a) It shall be the duty of the owner, master, or person in charge of a tank vessel to require and have performed at least once in every 12 months, the tests and inspections of all hand portable fire extinguishers, semiportable fire extinguishing systems, and fixed fire extinguishing systems on board, as described in paragraphs (b), (c), and (d) of this section. The owner, master, or person in charge shall keep records of such tests and inspections showing the dates when performed, the number and/or other identification of each unit tested and inspected, and the name(s) of the person(s) and/or company conducting the tests and inspections. Such records shall be made available to the marine inspector upon request and shall be kept for the period of validity of the vessel's current certificate of inspection. Where practicable, these records should be kept in or with the vessel's logbook. The conduct of these tests and inspections does not relieve the owner, master, or person in charge of his responsibility to maintain this firefighting equipment in proper condition at all times.

(b) The following tests and inspections of portable fire extinguishing equipment shall be made:

TABLE 31.10–18(b)

Type unit	Test
Soda acid	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Foam	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge.
Pump tank (water or antifreeze).	Discharge. Clean hose and inside of extinguisher thoroughly. Recharge with clean water or antifreeze.
Cartridge operated (water, antifreeze or loaded stream).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to he in unsuitable condition. Remove liquid, clean hose and inside of extinguisher thoroughly. Recharge with clean water, solution, or antifreeze. Insert charged cartridge.
Stored pressure (water, antifreeze or loaded stream).	See that pressure gage is in operating range. If not, or if seal is hroken, weigh or otherwise determine that full charge is in extinguisher. Recharge if pressure is low or if extinguishing agent is needed.
Carhon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge. Inspect hose and nozzle to he sure they are clear.[1]
Dry chemical (cartridge-operated type).	Examine pressure cartridge and replace if end is punctured or if cartridge is otherwise determined to have leaked or to be in unsuitahle condition. Inspect hose and nozzle to see if they are clear. Insert charged cartridge. Be sure dry chemical is freeflowing (not caked) and chamber contains full charge.
Dry chemical (stored pressure type).	See that pressure gage is in operating range. If not, or if seal is hroken, weigh or otherwise determine that full charge of dry chemical is in extinguisher. Recharge if pressure is low or if dry chemical is needed.
Vaporizing liquid[2] (pump type).	Pump a few strokes into clean pail and replace liquid. Keep water out of extinguisher or liquid. Keep extinguisher completely full of liquid.
Vaporizing liquid[2] (stored pressure type).	See that pressure gage is in operating range. Weigh or check liquid level to determine that full charge of liquid is in extinguisher. Recharge if pressure is low or if liquid is needed.

[1] Cylinders shall be tested and marked in accordance with the regulations of the Department of Transportation, as noted in Section 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

[2] Vaporizing-liquid type fire extinguishers containing carhon tetrachloride or chlorohromomethane or other toxic vaporizing liquids shall he removed from all vessels.

(c) The following tests and inspections of fixed fire extinguishing equipment shall be made:

TABLE 31.10–18(c)

Type system	Test
Foam	Systems utilizing a soda solution shall have such solution replaced. In all cases, ascertain that powder is not caked.
Carhon dioxide	Weigh cylinders. Recharge if weight loss exceeds 10 percent of weight of charge.[1]

[1] Cylinders shall be tested and marked in accordance with the regulations of the Department of Transportation, as noted in Section 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

(d) Deck foam systems shall be tested biennially by discharging foam for approximately 15 seconds from any nozzle designated by the marine inspector. It shall not be required to deliver foam from all foam outlets, but all lines and nozzles shall be tested with water to prove them to be clear of obstruction. Prior to the biennial inspection of deck foam systems utilizing a mechanical foam system, a representative sample of the foam liquid shall be submitted to the manufacturer who will issue a certificate indicating gravity, pH, percentage of water dilution and solid content.

(e) At each inspection for certification and at such other times as considered necessary, the inspector shall determine that all fire extinguishing equipment is in suitable condition and that the tests and inspections required by paragraphs (b) through (i) of this section have been conducted. In addition, the marine inspector may require such tests as are considered necessary to determine the condition of the equipment.

(f) On all fire extinguishing systems, all the piping, controls, valves, and alarms shall be checked by the marine inspector to ascertain that the system is in good operating condition.

(g) The fire main system shall be operated and the pressure checked at the most remote and highest outlets by the marine inspector. All fire hose shall be subjected to a test pressure equivalent to the maximum pressure to which they may be subjected in service, but not less than 100 p.s.i. The marine inspector shall check that the hose couplings are securely fastened in accordance with the regulations of this subchapter.

(h) At each inspection for certification and at such other times as considered necessary, all carbon dioxide cylinders for fixed, semiportable, and portable systems shall be examined and replaced if any corrosion is found. They shall also be checked by weighing to determine their contents, and if found to be more than 10 percent under the required contents of carbon dioxide, they shall be recharged.

(i) Steam smothering lines shall be tested with at least 50 pounds per square inch of air pressure or by blowing steam through the lines at the working pressure and a survey made for detecting cor-

rosion and defects using hammer test or such other means as may be necessary.

31.10–19 All firefighting equipment may be tested—TB/ALL. (a) During the inspection of firefighting equipment, the Officer in Charge, Marine Inspection, may require fire apparatus to be tested, and used, except as provided under paragraphs 31.10–18(h), and 34.15–90(a) of this subchapter.

31.10–20 Drydocking or hauling out—TB/ALL. (a) Except for extensions as authorized by the Commandant, each steel hull tank vessel shall be placed in a drydock or on a slipway or hauled out for examination within the periods set forth in this paragraph, depending upon the service.

(1) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 24 months if it operates in salt water an aggregate of more than 12 months in the 24-month period since it was last drydocked or hauled out.

(2) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 36 months if it operates in salt water an aggregate of more than 3 months but not more than 6 months in each 12-month period since it was last drydocked or hauled out. When a tank vessel exceeds this aggregate amount of service in salt water in any 12-month period since it was last drydocked or hauled out, it shall be drydocked or hauled out within 6 months after the end of that period or within the 36-month interval, whichever is earlier.

(3) Each tank vessel shall be drydocked or hauled out at intervals of 48 months if it operates in salt water an aggregate of more than 1 month but not more than 3 months in each 12-month period since it was last drydocked or hauled out.

(4) Each tank vessel shall be drydocked or hauled out at intervals not to exceed 60 months if it operates exclusively in fresh water or if it operates in salt water an aggregate not exceeding 1 month in each 12-month period since it was last drydocked or hauled out.

(5) Tank barges used in fresh water service exclusively need not be drydocked or hauled out during the first 60-month interval after date of build, but shall be drydocked or hauled out between that time and the end of the 120th month after date of build, and at least once in each 60-month interval thereafter.

(b) Each wood hull tank vessel shall be placed in drydock or on a slipway or hauled out for examination at intervals not to exceed 48 months.

(c) Each tank vessel, irrespective of service which has not complied with these drydocking requirements, either because it was on voyage or was tied up, shall be drydocked or hauled out upon the completion of such voyage or before being placed in service.

(d) Whenever any tank vessel is placed in drydock or on a slipway or hauled out for repairs it shall be the duty of the master, owner, or agent to report the same, together with the nature of any repairs or alterations contemplated, to the Officer in Charge, Marine Inspection, of that zone, and if the condition or age of the vessel, in the judgment of the inspectors, renders an examination necessary, a thorough inspection shall be made by them to determine what is necessary to make such vessel seaworthy and come within the provisions of the regulations in this subchapter.

(e) Sea chests, sea valves, sea strainers and bilge injection valves shall be examined at the time of the drydockings required by Paragraphs (a), (b), and (c) of this section and shall be opened up for internal examination when deemed necessary by the Officer in Charge, Marine Inspection.

31.10–23 [Deleted]

31.10–25 Inspection covering repairs and alterations involving safety—TB/ALL. No extensive alterations involving the safety of a tank vessel either in regard to hull or machinery shall be made without the approval of the Commandant. Before such alterations are carried out, copies of plans and specifications in triplicate for the work involved shall be forwarded to the Officer in Charge, Marine Inspection, in whose zone the repairs will be made, for submission to Headquarters for approval. If approved one set of the plans and specifications, properly stamped and dated, shall be returned to the owner or to the repair yard designated by the owner; one set to the Officer in Charge, Marine Inspection, who forwarded the plans and specifications to Headquarters; and one set shall be retained at Headquarters. If such plans and specifications are not approved, the Commandant shall promptly notify the owner or designated shipyard wherein they fail to comply with the regulations in this chapter. No extensive repairs to the hull or machinery which affect the safety of a vessel shall be made without the knowledge of the Officer in Charge, Marine Inspection.

31.10–30 Stability requirements—TB/ALL—(a) Application. The provisions of this section shall apply to the following tank vessels:

(1) Any tankship of 500 gross tons and over on an international voyage, construction or conversion of which is started on or after November 19, 1952.

(2) Any other vessel whose stability is questioned by the Commandant or the Officer in Charge, Marine Inspection.

(b) Stability test. (1) The stability of each new tank vessel or class of vessels to which this section pertains shall be subject to review by the Commandant to determine whether or not a stability test is required. Where such a review involving a comparison with existing similar vessels, clearly indicates that due to the vessel's propor-

tions and arrangements more than sufficient metacentric height will be available in all probable loading conditions, a stability test will not be required. Consistent with the foregoing principle, tank vessels will ordinarily not be required to be inclined if they have a molded beam in excess of 11 feet plus 1.5 times the molded depth, and further, if those vessels over 300 feet in length have two or more longitudinal bulkheads and those of 300 feet and less have at least one longitudinal bulkhead.

(2) The Commandant may allow the stability test of a tank vessel to be dispensed with provided basic stability data are available from the stability test of a sister vessel and it is shown to the satisfaction of the Commandant that reliable stability information for the exempted vessel can be obtained from such basic data.

(c) Plans required. (1) The following plans are essential for use in determining whether or not a stability test is to be required and should be made available as early as possible:

Lines plan.
Curves of form.
General arrangement plan of all decks and levels.
Inboard and outboard profile.
Midship section.

(2) If it is determined that a stability test is required, the following additional plans will be required:

Capacity plan showing capacities and vertical and longitudinal centers of gravity of all tanks and cargo spaces.
Tank sounding tables.
Draft mark locations.

(d) Information supplied to master. (1) Vessels which are exempted from a stability test in accordance with the provisions of subparagraph (b) (1) of this section will be provided with a stability letter recording this fact.

(2) Vessels for which a stability test is required or which are exempted from such a test in accordance with subparagraph (b) (2) of this section shall be provided with information, based upon the results of the applicable stability test, which is such that the master can, by rapid and simple process, obtain accurate guidance as to the stability of the vessel under varying conditions of service. Where special regard to particular operating conditions is necessary to assure safety of the vessel, full information relative thereto shall be included. The information required by this paragraph shall be submitted to the Commandant. Upon approval of this information, a stability letter recording this fact will be provided to the vessel.

(e) Stability letter. (1) Each tank vessel subject to the requirements of this section shall have posted under glass in the pilothouse a stability letter issued by the Coast Guard before the vessel is placed in service.

(2) Stability letters issued in accordance with subparagraph (d) (2) of this section will set forth the master's responsibility for maintaining satisfactory stability conditions at all times.

(f) Alterations. Where any alterations are made to a tank vessel so as to materially affect the stability information supplied to the master, amended stability information shall be provided. If necessary the vessel shall have a new stability test.

31.10-35 Permit to proceed to another port for repair—TB/ALL. (a) The Officer in Charge, Marine Inspection, may issue a permit to proceed to another port for repair, Form CG-948, to a vessel if in his judgment it can be done with safety even if the certificate of inspection of the vessel has expired or is about to expire.

(b) Such permit will only be issued upon the written application of the master, owner or agent of the vessel.

(c) The permit will state upon its face the conditions under which it is issued and whether or not the vessel is permitted to carry freight or passengers. Passengers may not be carried if the certificate of inspection has expired.

(d) The permit shall be carried in a manner similar to that described in Section 31.05-5 for a certificate of inspection.

(R.S. 4453, as amended; 46 U.S.C. 435)

31.10-40 Inspection during trial trip—T/ALL. On the trial trip of each new or converted tankship, an inspector shall be present to observe from the standpoint of safety in the carriage of flammable and/or combustible liquids in bulk, the operation of boilers, engines, steering gear, and auxiliaries; and if not satisfied with the performance of such boilers and machinery, appliances, and apparatus for stowage, he shall make such requirements as in his judgment will overcome any deficiencies which may have come under his observation.

31.10-45 Inspection of crew accommodations—TB/ALL. Crew's quarters shall be inspected to determine their sanitary condition. The Officer in Charge, Marine Inspection, upon completing such inspection, shall notify the master or officer in charge of the vessel of his findings, which shall be entered in the vessel's logbook.

(Sec. 4, 49 Stat. 1935, as amended; 46 U.S.C. 660a)

31.10-50 Inspection of bilges—TB/ALL. (a) When inspecting oil-burning vessels, either internal-combustion type or steam-driven type, the marine inspector shall examine the tank tops and bilges in the fireroom and engineroom to see that there is no accumulation of oil which might create a fire hazard.

(Interpret or apply R.S. 4488, as amended, 46 U.S.C. 481)

SUBPART 31.15—MANNING OF TANK VESSELS

31.15-1 Licensed officers and crews—TB/ALL. (a) The Officer in Charge, Marine Inspection, who inspects the vessel, shall make in the certificate of inspection for each tank vessel an

entry of such complement of officers and/or crew as required by law and regulations in this subchapter, and which in the judgment of the Officer in Charge, Marine Inspection, will be necessary for her safe operation. The complement may be changed from time to time by endorsement on such certificate by an Officer in Charge, Marine Inspection, by reason of change of conditions or employment.

(b) In all cases where a certificate of inspection does not require at least two licensed officers, the Officer in Charge, Marine Inspection, shall enter in the certificate of inspection issued to any manned tank vessel subject to the regulations in this subchapter the number of the crew required to be certificated as tankermen. If the total complement of a tank vessel is either one or two persons, only one such person need be a certificated tankerman. If the total complement exceeds two, only two such persons need be certificated tankermen.

(R.S. 4463, as amended, sec. 2, 40 Stat. 549, as amended; 46 U.S.C. 222, 223)

31.15-5 Tank barges—B/ALL. (a) Tank barges need not be manned unless in the judgment of the Officer in Charge, Marine Inspection, such manning is necessary for the protection of life and property and for the safe operation of the vessel: *Provided, however,* That towing vessels, while towing barges which are not required to be manned, shall carry in the regular complement of the towing vessel and shall have on board at all times while towing, at least one licensed officer or certificated tankerman.

(b) Where the bulk liquid cargo to be transported is covered by the requirements of Section 35.01-55 of this subchapter, the person in charge of the towing vessel or barge shall be provided with, and have on board, the information card required by Section 35.01-55.

31.15-6 Tank barges carrying bulk cargoes having dangerous characteristics in addition to flammability or combustibility—B/ALL. (a) For those tank barges carrying a bulk liquid cargo covered by the requirements of Section 35.01-55 of this subchapter, at least one member of the crew of the barge required to be manned pursuant to Section 31.15-5 shall be especially qualified in the handling of the specific cargo to be carried. The Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in and capable of performing competently the necessary operations which relate to the carriage and transfer of such cargo.

(Interpret or apply R.S. 4488, as amended; 46 U.S.C. 481)

31.15-10 Towing vessels may carry persons in addition to crew—B/LBR. (a) Towing vessels engaged in towing tank barges on the Great Lakes, inland waters, or rivers, may be authorized by the Coast Guard District Commander of the district to carry on board such number of persons in addition to its crew as shall be deemed necessary to carry on the legitimate business of such towing vessel or barge, not exceeding, however, one person to every net ton of the towing vessel.

(b) A Coast Guard District Commander granting a license to a vessel engaged in towing to carry persons in addition to its crew shall notify the Officer in Charge, Marine Inspection, in whose jurisdiction the vessel receiving the permit is engaged, and the Officer in Charge, Marine Inspection, shall keep a record of the same.

(Sec. 1, 24 Stat. 129, as amended; 46 U.S.C. 458)

SUBPART 31.20—WATERS OPERATED OVER

31.20-1 Waters—TB/ALL. The certificate of inspection shall show the waters over which the tank vessel is permitted to operate, such as: all waters; oceans; coastwise; Great Lakes; bays, sounds, and lakes other than the Great Lakes; rivers; or inland waters tributary to the Gulf of Mexico.

SUBPART 31.25—LOAD LINES

31.25-1 Load lines required—TB/OCL. All tank vessels of 150 gross tons or over navigating the oceans, coastwise waters, and Great Lakes are subject to the regulations in Parts 43 to 45, inclusive, Subchapter E (Load Lines) of this chapter.

SUBPART 31.30—MARINE ENGINEERING

31.30-1 Marine engineering regulations and material specifications—TB/ALL. (a) All tank vessels are subject to the regulations contained in Parts 50 to 63, inclusive, of Subchapter F (Marine Engineering) of this chapter, whenever applicable, except as such regulations are modified by the regulations in this subchapter for tank vessels.

(Sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 2, 14 U.S.C. 2, 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2), R.S. 4472, as amended, sec. 14, 29 Stat. 690, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, as amended; 46 U.S.C. 170, 363, 367) [CGFR 68-82, 33 F.R. 18804, Dec. 18, 1968]

SUBPART 31.35—ELECTRICAL ENGINEERING

31.35-1 Electrical installations, lighting and power equipment, batteries, etc.—TB/ALL. All tank vessels are subject to the regulations contained in Subchapter J (Electrical Engineering) of this chapter except as such regulations are modified by the regulations in this subchapter for tank vessels.

31.35-5 Communications; alarm systems, telephone and voice tube systems, engine telegraph systems, etc.—TB/ALL. All tank vessels are subject to the regulations contained in Subchapter J (Electrical Engineering) of this chapter except as such regulations are modified by the regulations in this subchapter for tank vessels.

SUBPART 31.37—INSPECTION OF CARGO GEAR

31.37-1 When made—TB/ALL. (a) The specific tests and examinations shall be made at the intervals stated in the regulations in this subpart.

(b) A thorough examination of the assembled gear shall be made at least once in every year.

(c) An inspection to determine the condition and suitability of shipboard cargo gear will be made by a marine inspector at each inspection for certification. Inspections may be made at such other times as considered necessary by the Officer in Charge, Marine Inspection.

(d) For vessels fitted with cargo gear, an initial inspection of the assembled units under proof loads shall be conducted, followed by a complete dismantling or disassembling of such gear and a thorough examination of the parts to ascertain its condition. Subsequent tests of the assembled units under proof loads, followed by a dismantling or disassembling of such gear and a thorough examination shall be made once every 4 years, or oftener if necessary.

31.37-3 Definitions of terms and words used in this subpart—TB/ALL. (a) Cargo gear. The term "cargo gear" includes masts, stays, booms, winches, cranes, elevators, conveyors, standing and running gear forming that part of the shipboard cargo gear used in connection with the loading or unloading of dry cargo. This term does not include the gear used for handling cargo hoses or ship stores only.

(b) Dismantling or disassembling of gear. The "dismantling" or "disassembling" of gear contemplated is the taking apart of units of gear to the extent necessary to determine the suitability of such gear for continued service and as may be specifically required to carry out the intent of a particular provision in this subpart. After proof load tests, the disassembling need not include the sheaves and pins of the blocks included in the test unless there appears to be evidence of deformation or failure.

(c) Thorough examination. The "thorough examination" contemplated is a visual examination, supplemented if necessary by other means such as by a hammer test or by a test with electronic or ultrasonic devices.

(d) Ton. The word "ton" means a ton of 2,240 pounds.

(e) Safe working load. The "safe working load" (SWL) contemplated is the load the gear is approved to lift, excluding the weight of the gear itself.

31.37-5 Tests and examinations of shipboard cargo gear—TB/ALL. (a) For vessels fitted with cargo gear and without valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, inspections shall be made by those competent persons described in subparagraph (c) (1) and (2) of Section 31.10-16, to determine the condition and suitability of the shipboard cargo gear. For the initial and subsequent quadrennial inspections, all the cranes, winches, hoists, derrick booms, derrick and mast bands, and all parts used in loading or unloading cargo shall be assembled in units and such assembled units shall then be tested under proof loads. The proof loads shall be handled for various types of units as required by specific regulations in this subpart. After the proof load tests of the assembled units of gear have been made, such gear shall be disassembled or dismantled so as to permit them to be thoroughly examined. The sheaves and pins of the blocks included in these proof load tests need not be removed unless there appears to be evidence of deformation or failure.

(b) For vessels fitted with cargo gear and holding valid cargo gear certificates and registers issued by organizations or associations recognized by the Coast Guard, the marine inspectors may accept such certificates as prima facie evidence of compliance with the requirements in this subpart. If an Officer in Charge, Marine Inspection, is in doubt as to the condition and suitability of shipboard cargo gear for such a vessel, the tests and examinations, or such portions thereof as deemed necessary, provided for in this subpart will be required.

(c) If any part or portion of the gear fails or becomes defective during such tests, such defective equipment shall be satisfactorily repaired or replaced.

31.37-15 Cargo gear plans required when plans are not approved by a classification society or recognized cargo gear organization—TB/ALL.[1] (a) For a new vessel or a vessel applying for initial inspection, the following plans of cargo gear are required to be submitted in triplicate to the Officer in Charge, Marine Inspection, for approval:

(1) Plans showing a stress diagram with the principal details of the gear.

(2) Plans containing a diagram showing the arrangement of the assembled gear and indicating the safe working load for each component part.

(b) The safe working load on which the design of any component part of the cargo gear is to be based, shall be taken as the maximum resultant load upon the component part in the design conditions assumed. The safe working load of the assembly is the load the gear is approved to lift, excluding the weight of the gear itself.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

31.37-20 Cargo gear plans approved by a classification society—TB/ALL. (a) The plans required by Paragraph 31.37-15(a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by the American Bureau of Shipping or similar classification society recognized by the Commandant.

(b) One approved copy of each set of cargo gear plans shall be retained on the vessel.

[1] 33 F.R. 14703, Oct. 2, 1968.

31.37-23 Cargo gear plans approved by a recognized cargo gear organization—TB/ALL. (a) The plans required by paragraph 31.37-15 (a) need not be submitted to the Officer in Charge, Marine Inspection, for approval if such plans are or have been approved by a recognized cargo gear organization listed in paragraph (b) of this section.

(b) The following cargo gear organizations are recognized as having the technical competence to handle the required review of cargo gear plans, including stress and arrangement diagrams, and this recognition will continue in effect until suspended, canceled, or modified by proper authority:

(1) International Cargo Gear Bureau, Inc., with home office at 17 Battery Place, New York, N.Y. 10004.

(c) One approved copy of each set of cargo gear plans shall be retained on the vessel.

(33 F.R. 14703, Oct 2, 1968)

31.37-25 Factors of safety—TB/ALL. (a) In the design of the cargo gear, the safety factors in Table 31.37-25(a) taken in association with suitable design assumptions for actual loading conditions, shall be used and regarded as minima.

(b) The Commandant will give consideration to the use of factors of safety differing from those given in Table 31.37-25(a) where special materials or cargo gear of special design are to be used.

TABLE 31.37-25(a)

Safe working loads for component parts	Safety factors based on—		
	Ultimate strength	Yield point	Breaking test load
All metal structural parts, except steel booms:			
When the working load of the assembled gear is 10 tons or less	[1] 5	----------	----------
When the working load of the assembled gear is 13 tons or over	[1] 4	----------	----------
Steel booms:			
When the working load of the assembled gear is 10 tons or less	----------	[1] 3	----------
When the working load of the assembled gear is 13 tons or over	----------	[1] 2½	----------
Wooden structural parts	8	----------	----------
Chains	4½	----------	----------
Wire rope:			
For working loads 10 tons or under	----------	----------	5
For working loads over 10 tons	----------	----------	4
Fiber rope:			
When intended for running rigging	7	----------	----------
When intended for fixed gear and vangs	5	----------	----------

[1] For working loads between 10 and 13 tons, intermediate values of safety factors may be used.

31.37-30 Loose gear certificates and tests—TB/ALL. (a)(1) Evidence of compliance with the proof load test requirements in this section for all chains, rings, hooks, links, shackles, swivels, blocks, and any other loose gear whether accessory to a machine or not, but which is used as ship's cargo gear, shall be listed on an appropriate certificate.

(2) This evidence of test and the recording thereof is required only once with respect to each article of gear so long as each article is identified and the certificates required are available on the vessel.

(3) Proof loads applied to the articles of loose gear shall be as shown in Table 31.37-30(a)(3).

TABLE 31.37-30(a)(3)

Article of gear	*Proof load*
Chains, rings, hooks, links, shackles, swivels.	Twice the safe working load.
Single sheave block	Four times the safe working load.[1]
Multiple sheave block with safe working load up to and including 20 tons.	Twice the safe working load.
Multiple sheave block with safe working load over 20 tons up to and including 40 tons.	20 tons in excess of the safe working load.
Multiple sheave block over 40 tons	One and a half times the safe working load.
Chain fall blocks used with roller chains (pitched chains), and rings, hooks, shackles, or swivels permanently attached thereto.	Do.

[1] The proof load applied to the block is equivalent to twice the maximum resultant load on the eye or pin when lifting the safe working load attached to a rope which passes around the sheave of the block. The proof load is, therefore, equal to four times the safe working load or twice the safe working load when the load is attached directly to the block instead of a rope passing around the sheave.

(b) All chains, rings, hooks, links, shackles, swivels, blocks and any other loose gear, whether accessory to a machine or not, but which are used or intended for use as ship's cargo gear, shall bear a mark or number by which each piece can be identified when listed on a loose gear certificate. The safe working load "SWL" shall be marked on all blocks.

(c) The loose gear certificate shall show the distinguishing number or mark applied to the article of gear; a description of the article of gear; the date when the test proof load was applied; and the safe working load. The forms for loose gear certificates shall be as prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(d) After being tested, all of the gear shall be examined to ascertain whether any part has been damaged, permanently deformed by the test, or has other visible defects. The pins and sheaves of all tested blocks shall be removed for this purpose. If damaged during these tests, such gear shall be satisfactorily repaired or replaced.

(e) The required examinations as set forth in paragraph (d) of this section may be accomplished by mechanical, electrical or other means provided the method employed is equal in efficiency to the visual examination of disassembled gear.

31.37-35 Test and certification of wire rope—TB/ALL. (a) All wire rope used as shipboard cargo gear shall be able to withstand a breaking test load of at least five times the safe working load. In the case of gear with a lifting capacity of over 10 tons, the breaking test load of wire rope shall be at least four times the safe working load. All wire rope shall be identified and described in

a wire rope certificate. Such certificate shall be furnished and attested to by the manufacturer or a testing agency and shall certify:

(1) The breaking test load of a sample of the wire rope, which should be at least five times the safe working load or at least four times the safe working load if part of gear with a lifting capacity of over 10 tons;

(2) The name and address of the manufacturer;

(3) The diameter of the rope in inches and/or fractions thereof;

(4) The number of strands and the number of wires in each strand;

(5) The quality of the wire (e.g., improved plow steel);

(6) The date of the test; and,

(7) The load at which the sample broke.

(b) The forms for the wire rope certificate shall be prescribed by and acceptable to associations or organizations approved by the Commandant and shall be suitable for the purposes described in this section.

(c) In addition to the manufacturers' or testing agencies' attestations, a sample of the wire rope may be tested to destruction if required by the marine inspector when a visual inspection indicates an apparent defective condition.

31.37–40 Proof test of cargo gear as a unit—TB/ALL. (a) Winches with their accessory gear, including the derricks and attachments, at least once in each four years, shall be tested as a unit with proof loads exceeding the safe working load as set forth in Table 31.37–40(a).

TABLE 31.37–40(a)

Safe working load of assembled gear	*Proof load*
Not exceeding 20 tons	25 percent in excess.
Over 20 tons but not exceeding 50 tons	5 tons in excess.
Over 50 tons	10 percent in excess.

(b) The proof load applied to winches and their gear shall be lifted with the ship's normal tackle, including the winches, and with the boom at an angle which should not be greater than 15 degrees to the horizontal or to the lowest angle approved in association with the design, or when these angles are impracticable, to the lowest practicable angle. When the load has been lifted, it shall be swung as far as possible in both directions.

(1) Where electrical winches are fitted with electromagnetic brakes, or where electrohydraulic winches are fitted with electromagnetic or hydraulic brakes at the winch, mechanical brakes for manual operation will not be required, but if so fitted shall be in satisfactory operating condition.

(2) Current for electric winch operation during the test shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

(c) Cranes and other hoisting machines with their accessory gear at least once in each four years, shall be tested, with a proof load which shall exceed the safe working load as set forth in Table 31.37–40(a).

(d) The proof load applied to cranes and hoists shall be lifted, topped, and swung (slewed) as far as possible in each direction. If the boom of the crane has a movable radius, it shall be tested with a proof load as set forth in this section at the maximum and minimum radii of the boom. In the case of hydraulic cranes whose capacity is limited by pressure, and with which it is not possible to lift a load 25 percent in excess of the safe working load, the greatest possible load in excess of the safe working load shall be used. These tests and the amounts of the loads shall be recorded.

(e) After satisfactory completion of the proof load testing of the cargo gear in accordance with paragraphs (a) through (d) of this section, the cargo gear and all component parts shall be given a thorough visual examination, supplemented as necessary by other means such as a hammer test or with electronic or ultrasonic devices, to determine if any of the parts were damaged, deformed, or otherwise rendered unsafe for further use. If found defective, such gear shall be replaced.

(1) When the test is being conducted for the first time on a vessel, accessory gear shall be dismantled or disassembled for examination after the test. The sheaves and pins of the blocks included in this test need not be removed unless there appears to be evidence of deformation or failure.

(2) For subsequent tests such parts of the machinery and gear shall be dismantled and/or disassembled after the test as necessary to determine its suitability for continued service.

(f) Appropriate means shall be provided to prevent the foot of the boom from being accidentally lifted from the socket during the test.

(g) Vessels whose cargo gear has been in use but are without the valid registers and certificates described in Section 31.10–16 will be inspected for defective cargo gear. The gear shall then be tested and examined as prescribed in this section. If the movable weights for proof testing are not reasonably available, a spring or hydraulic scale certified for accuracy may be used. Whenever such scales are used, the proof load shall be applied with the boom swung out as far as possible in one direction and then in the other direction, and at such intermediate positions as may be indicated. At any position, the indicator of the scale must maintain a constant reading under the proof load for a period of five minutes.

(h) On all types of winches and cranes efficient means shall be provided to stop and hold the proof

load in any position, and the efficiency of such means shall be demonstrated.

(1) Electric winches, electrohydraulic winches fitted with electromagnetic or hydraulic brakes at the winch, or cranes shall be equipped so that a failure of the electric power shall stop the motion and set the brakes without any action on the part of the operator.

(2) Current for electric winches and cranes operation during the tests shall be taken from the ship's circuits. Shore current may be used if it passes through the ship's switchboard.

31.37–45 Marking of booms and cranes—TB/ALL. (a) The safe working load (abbreviated "SWL") for the assembled gear shall be marked on the heel of each boom, with the minimum angle to the horizontal for which the gear is designed. These letters and figures shall be in contrasting colors to the background and at least one inch in height.

(b) Where booms are rated at varying capacities depending on the radii, tables indicating the maximum safe working loads for the various working angles of the boom and the maximum and minimum radii at which the boom may be safely used shall be conspicuously posted near the controls and visible to the operator when working the gear.

31.37–50 Use of wire rope and chains—TB/ALL. (a) An eye splice made in any wire rope used as cargo gear, with or without a thimble, shall have at least three tucks with whole strands and two tucks with one half of the wire cut from the tucking strand: *Provided*, That this requirement shall not preclude the use of any other form of splice or connection if it is as efficient as the splice specified.

(b) Single wire rope cargo falls, wire rope pendants, topping lifts and preventers shall consist of clear lengths without splices except at the working ends. Wire rope clips shall not be used to form eyes in the working ends of single wire rope cargo falls.

(c) Wire rope shall not be used for shipboard cargo gear if in any length of 8 diameters, the number of visible broken wires exceeds ten percent of the total number of wires in the rope, or if the rope shows other signs of excessive wear, corrosion, kinking, or defect.

(d) Hoisting or sling chains used for shipboard cargo gear shall not be used if a length of chain has been stretched more than five percent of the original length, or the chain has become unsafe through overloading or faulty heat treatment, or whenever other external defects are evident.

(e) Chains used for shipboard cargo gear shall not be shortened by knotting, bolting, or wiring the links. The use of chains having a knot or kink as shipboard cargo gear is prohibited.

31.37–55 Annealing—TB/ALL. (a) Chains, hooks, rings, links, shackles, and swivels of wrought iron used as cargo gear shall be annealed at the following intervals:

(1) Wrought iron chains and gear in general use and of one half inch or less, at least once in every six months.

(2) All other wrought iron chains and gear, including topping lift chains, in general use, at least once in every twelve months.

(b) The annealing shall be done in a suitable closed oven and not over an open fire. Wrought iron shall be annealed at a temperature of between 1100° and 1200° Fahrenheit for a period of between 30 and 60 minutes. After being annealed, the article shall be allowed to cool slowly and shall be then tested completely for defects.

(c) Heat treatment of the cargo gear shall be done only by reputable firms having suitable equipment and personnel trained for this purpose. A certificate attesting to the annealing shall be furnished for all gear so treated.

(d) The heat treatment of chains, hooks, rings, links, shackles, and swivels of materials other than wrought iron used as cargo gear, if required, shall be effected in accordance with the manufacturer's instructions.

31.37–60 Additions to gear—TB/ALL. (a) When articles of loose gear and/or wire rope conforming with the requirements in this subpart are added to installed gear, or used as replacements in such gear from time to time, a record shall be maintained on the vessel which shall identify each article and the certificate accompanying it.

31.37–65 Alterations, renewals, or repairs of cargo gear—TB/ALL. (a) Whenever important repairs, renewals, or alterations are indicated or intended for the masts, booms, and permanent fittings of the cargo gear, such repairs, renewals, or alterations shall be undertaken only after compliance with Section 31.10–25.

(b) Tests and examinations of the repairs, renewals, or alterations will be in accordance with Section 31.37–40.

(c) When welding is used to lengthen, alter, or repair chains, rings, hooks, links, shackles, or swivels, they shall be properly heat treated and shall, before being again put into use, be tested and examined in accordance with the provisions of Section 31.37–30.

31.37–70 Responsibility of ship's officer for inspection of cargo gear—TB/ALL. (a) All wire rope, chains other than bridle chains attached to booms or masts, and all rings, hooks, links, shackles, swivels, and blocks used in loading or unloading shall be visually inspected by a ship's officer designated for that purpose by the master.

(b) These inspections by a ship's officer shall be made at frequent intervals, and in any event not less than once in each month.

(c) Immediately after such an inspection by a ship's officer notations of such an inspection shall be made in record form which shall be in or kept with the cargo gear register if carried. In addition, the same notations of inspections together with the dates shall be entered in the Official Logbook for those vessels required to carry this record, or such information shall be kept with the log records maintained on vessels not required to carry the Official Logbook. (See Section 31.37–75 for entries required to be kept.)

31.37–75 Records regarding cargo gear—TB/ALL. (a) The cargo gear records described in this subpart shall be maintained on the vessel and shall be made available to Coast Guard officials upon request. These records shall be kept for the periods of time they are valid and, in addition, until the next Coast Guard inspection for certification of the vessel. The certificates of manufacturers and/or testing laboratories, companies, or organizations shall be maintained on the vessel so long as the gear described in such certificates is on board the vessel.

(b) The records of all the inspections of cargo gear made by the ship's officers in accordance with Section 31.37–70 shall be maintained on the vessel for periods of time which agree with those periods as covered by the current Coast Guard certificate of inspection issued to the vessel. These records shall show the dates of inspections, identify articles inspected, the conditions observed, and the name of the officer performing the inspection.

(c) The records of all tests and examinations conducted by or under the supervision of surveyors of the organizations or associations approved by the Commandant shall be maintained on the vessel.

(d) The Coast Guard will not issue cargo gear certificates and/or registers. The Coast Guard's records of inspections, tests, and examinations of a particular vessel's cargo gear made by a marine inspector or conducted under the supervision of the Coast Guard will be maintained in the Office of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel at the time such work was performed. The original certificates or certified copies of certificates of manufacturers and/or testing laboratories, companies, or organizations for loose cargo gear, wire rope, or the annealing of gear shall be maintained on the vessel.

31.37–80 Advance notice that cargo gear testing is desired—TB/ALL. (a) The owner, agent, or master of a vessel shall give an advance notice when it is desired that the tests and examinations of cargo gear be made by or under the supervision of the marine inspectors. This advance notice shall be given to the Officer in Charge, Marine Inspection, in whose marine inspection zone the vessel is available for such inspection and examination.

(b) For the initial inspection and examination of cargo gear by the Coast Guard, the advance notice shall be to the cognizant Officer in Charge, Marine Inspection, as early as possible and shall include sketches and/or drawings showing each unit of cargo gear, the identification of component parts and the safe working loads. Copies of original certificates of manufacturers and/or testing laboratories, companies, or organizations maintained on the vessel may be accepted by the cognizant Officer in Charge, Marine Inspection, when satisfied such certificates properly describe the qualities of the component parts of the gear in question.

31.37–85 Responsibility for conducting required tests and examinations—TB/ALL. (a) The vessel's owners and/or operators shall furnish and pay the expenses required in conducting the tests and examinations prescribed by the regulations in this subpart, including the supplying of all instruments, other equipment, and personnel including personnel supervision for performance of all work required.

(b) The Coast Guard's participation in these required tests and examinations shall be confined to witnessing required tests and examinations with the view to determining whether or not the gear is satisfactory for the purpose intended. In the event it is determined that the gear is defective or unable to meet the standards set forth in this subpart, such gear, or portions thereof, shall be replaced to the satisfaction of the Officer in Charge, Marine Inspection, having jurisdiction over the vessel.

SUBPART 31.40—CERTIFICATES UNDER INTERNATIONAL CONVENTION FOR SAFETY OF LIFE AT SEA, 1960

31.40–1 Application—T/ALL. (a) The provisions of this subpart, with the exception of Sections 31.40–30 and 31.40–40(e), shall apply to all tankships on an international voyage other than nuclear vessels.

(b) The provisions of Sections 31.40–30, 31.40–35 and 31.40–40(e) shall apply to nuclear tankships on an international voyage.

31.40–5 Cargo Ship Safety Construction Certificate—T/ALL. (a) All tankships on an international voyage are required to have a Cargo Ship Safety Construction Certificate. This certificate shall be issued by the U.S. Coast Guard or the American Bureau of Shipping to certain vessels on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960.

(b) All such tankships shall meet the applicable requirements of this chapter for tankships on an international voyage.

31.40–10 Cargo Ship Safety Equipment Certificate—T/ALL. (a) All tankships on an international voyage are required to have a Cargo Ship Safety Equipment Certificate.

(b) All such tankships shall meet the applicable requirements of this chapter for tankships on an international voyage.

31.40–15 Cargo Ship Safety Radiotelegraphy Certificate—T/ALL. (a) The application for a Cargo Ship Safety Radiotelegraphy Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelegraphy Certificate will be issued by the Federal Communications Commission to a tankship meeting its requirements for a tankship fitted with a radiotelegraph installation.

31.40–20 Cargo Ship Safety Radiotelephony Certificate—T/ALL. (a) The application for a Cargo Ship Safety Radiotelephony Certificate is made on FCC Form 801 to the local office of the Federal Communications Commission.

(b) Where applicable, a Cargo Ship Safety Radiotelephony Certificate will be issued by the Federal Communications Commission to a tankship meeting its requirements for a tankship fitted with a radiotelephone installation.

31.40-25 Exemption Certificate—T/ALL. (a) A tankship may be exempted by the Commandant from complying with certain requirements of the Convention under his administration upon request made in writing to him and transmitted via the Officer in Charge, Marine Inspection.

(b) When an exemption is granted to a tankship by the Commandant under and in accordance with the Convention, an Exemption Certificate describing such exemption shall be issued through the appropriate Officer in Charge, Marine Inspection, in addition to other required certificates.

31.40–30 Nuclear Cargo Ship Safety Certificate—T/ALL. (a) All nuclear tankships on an international voyage are required to have a Nuclear Cargo Ship Safety Certificate.

(b) All such ships shall meet the applicable requirements of this chapter for nuclear vessels on an international voyage.

(c) Nuclear vessels cannot be exempted from any requirements of the Convention.

31.40–35 Posting of Convention certificates—T/ALL. (a) The certificates described in this subpart, or certified copies thereof, when issued to a vessel shall be posted in a prominent and accessible place on the tankship.

(b) The certificates shall be carried in a manner similar to that described in Section 31.05–5 for a certificate of inspection.

31.40–40 Duration of Convention certificates—T/ALL. (a) A Cargo Ship Safety Equipment Certificate shall be issued for a period of not more than 24 months.

(b) A Cargo Ship Safety Construction Certificate shall be issued for a period of not more than 60 months.

(c) A Cargo Ship Safety Radiotelegraphy Certificate and a Cargo Ship Safety Radiotelephony Certificate shall be issued for a period of not more than 12 months.

(d) An Exemption Certificate shall not be valid for longer than the period of the certificate to which it refers.

(e) The Nuclear Cargo Ship Safety Certificate shall be issued for a period of not more than 12 months.

(f) A Convention certificate may be withdrawn, revoked, or suspended at any time when it is determined the vessel is no longer in compliance with applicable requirements. (See Section 2.01–70 of this chapter for procedures governing appeals.)

31.40–45 American Bureau of Shipping—T/ALL. (a) The American Bureau of Shipping, with its home office at 45 Broad Street, New York, N.Y., 10004, is hereby designated as an organization duly authorized to issue the "Cargo Ship Safety Construction Certificate" to certain tankships on behalf of the United States of America as provided in Regulation 12, Chapter I, of the International Convention for Safety of Life at Sea, 1960, and Executive Order 11239 and the certificate shall be subject to the requirements in this subpart. The American Bureau of Shipping is authorized to place the official seal of the United States of America on the certificate. This designation and delegation to the American Bureau of Shipping shall be in effect from May 26, 1965, until terminated by proper authority and notice of cancellation is published in the Federal Register.

(b) At the option of the owner or agent of a tankship on an international voyage and on direct application to the American Bureau of Shipping, the Bureau may issue to such tankship a Cargo Ship Safety Construction Certificate, having a period of validity of not more than 60 months after ascertaining that the tankship:

(1) Has met the applicable requirements of the Convention; and,

(2) Is currently classed by the Bureau and classification requirements have been dealt with to the satisfaction of the Bureau.

(c) When the Bureau determines that a tankship to which it has issued a Cargo Ship Safety Construction Certificate no longer complies with the Bureau's applicable requirements for classification, the Bureau shall immediately furnish to the Coast Guard all relevant information, which will be used by the Coast Guard to determine whether or not to withdraw, revoke or suspend the Cargo Ship Safety Construction Certificate.

(Sec. 25, 41 Stat. 998, as amended, sec. 701, 62 Stat. 731, as amended; 16 U.S.C. 881, 18 U.S.C. 701)

PART 32—SPECIAL EQUIPMENT, MACHINERY, AND HULL REQUIREMENTS

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32.65-1 Application—TB/ALL.
32.65-5 Scantlings, material, and workmanship—TB/ALL.
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AUTHORITY: The provisions of this Part 32 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2); sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.

SUBPART 32.01—SAFETY REQUIREMENTS

32.01-1 Means of escape—T/ALL. On all tankships where the plans and arrangements will possibly permit, all passageways leading to living quarters, or places where anyone may be regularly employed, shall be provided with not less than two avenues of escape so located that if one of such avenues is not available another may be. The locality and arrangement of such additional means of escape shall be determined by the inspectors as will in their judgment best carry out the purpose for which this provision was made.

32.01-5 Lifelines—TB/OCLB. On all tank vessels where the distance is more than 150 feet between deckhouses, a wire cable shall be stretched between the deckhouses at all times when the vessel is loaded and being navigated, this cable to be not less than 5 feet from the deck; and there shall be attached at all times to the cable a traveler with a line of sufficient continuous length to insure its operation in order that communication between both ends of the vessel may be facilitated at all times: *Provided*, That in addition to the traveler with the endless whip, as many loose rings with lanyards attached may be placed on the cable as may be deemed necessary by the master in charge of the vessel: *Provided further*, That a fore and aft raised bridge shall be accepted in lieu of the wire cable and traveler.

32.01-10 Rails—TB/ALL. (a) All tank vessels, except unmanned tank barges, the construction or conversion of which is started on or after January 1, 1957, shall be fitted with fixed or portable rails on decks and bridges. All rails shall be in at least two courses, including the top, and shall be at least 36 inches high, and in no case shall the clear spaces between the courses exceed 18 inches.

However, on tank vessels operating on ocean waters the outboard rails on all decks shall be in at least three courses, including the top, and shall be evenly spaced and shall be at least 36 inches high. All rails shall consist of solid or tubular sections or chains or wire rope or a combination thereof.

(b) For all tank vessels, except those navigating the rivers only, the construction or conversion of which was started after September 11, 1946, and prior to January 1, 1957, rails on decks or bridges, shall be in at least two courses, including the top, and shall be at least 36 inches high.

32.01-15 Guards at dangerous places—TB/ALL. All exposed and dangerous places such as gears and machinery shall be properly protected with covers, guards or rails in order that the danger of accidents may be minimized. On vessels equipped with radio communication, the lead-ins shall be efficiently incased or insulated to insure against accidental shock. Such lead-ins shall be located so as not to interfere with the launching of lifeboats and liferafts.

SUBPART 32.05—MARKINGS

32.05-1 Draft marks—TB/ALL. (a) All tank vessels of 50 gross tons and over shall have the draft of the vessel plainly and legibly marked upon the stem and upon the sternpost or rudderpost or at any place at the stern of the vessel as may be necessary for easy observance. The draft shall be taken from the bottom of the keel at the marks to the surface of the water, the bottom of the mark to indicate the draft in feet.

(b) In cases where the keel does not extend forward or aft to the location of the draft marks, due to raked stem or cutaway skeg, the datum line from which the drafts shall be taken, shall be obtained by projecting the line of the bottom of the keel forward or aft, as the case may be, to the location of the draft marks.

(c) In cases where a vessel may have a skeg or other appendage extending locally below the line of the keel, the draft at the end of the vessel adjacent to such appendage shall be measured to a line tangent to the lowest part of such appendage and parallel to the line of the bottom of the keel.

32.05-5 Vessel's name on equipment—TB/ALL. The equipment of all tank vessels, such as firehose, fire axes, lifeboats, liferafts, life preservers, and lifefloats, shall be painted or branded with the name of the vessel upon which they are used.

32.05-10 Name of tankship—T/ALL. Every tankship not documented by the Commissioner of Customs shall have the name marked upon each bow and upon the stern, and the home port shall also be marked upon the stern. The name shall be in a light color on a dark ground, or in a dark color on a light ground, and shall be distinctly visible. The smallest letters used shall be not less than 4 inches in size. In addition, every tankship shall have her name conspicuously displayed in distinct plain letters, of not less than 6 inches in size, on each outer side of the pilothouse.

32.05-15 Name of tank barge—B/ALL. Every tank barge not documented by the Commissioner of Customs shall have its name or number carved, punch-marked, or welded on the main beam, inside the cargo hatch, or other suitable permanent part of the vessel's structure for the purpose of identification. The vessel's name or number shall be so displayed at the highest part of the vessel's hull or permanent structure that the name or number can be seen from either side.

SUBPART 32.15—NAVIGATION EQUIPMENT

32.15-1 Fog sound signal devices—TB/ALL. (a) The efficient fog bell required upon vessels by law shall be held to mean a bell not less than 8 inches in diameter from outside to outside and constructed of bronze or brass or other material equal thereto in tone and volume of sound, and located where the sound shall be the least obstructed.

(b) In addition to the bell required in Paragraph (a), all tankships of over 350 feet in length, other than those operating exclusively on the Great Lakes or the inland waters of the United States, shall be provided with a fog gong which will produce a sound easily distinguishable from the bell required by Paragraph (a) and which shall have a range of audibility approximating that of the bell.

32.15-3 Navigation lights and shapes—TB/ALL. (a) *When required.* All tank ships shall be equipped with navigation lights and shapes as prescribed by law and regulation and shall display such navigation lights and shapes whenever prescribed by law or regulation. Tank barges need not be equipped with navigation lights and shapes, but such tank barges shall display navigation lights and shapes whenever prescribed by law or regulation.

(b) *Light screens.* Light screens required by the applicable Rules of the Road for port and starboard side lights shall be painted with a glossy black paint and shall project not less than three (3) feet forward of the center of the light source.

32.15-5 Whistles—T/ALL. (a) Each tankship shall be provided with an efficient whistle sounded by steam or by some substitute for steam to give the necessary whistle signals. All whistles shall be placed at an elevation of not less than 6 feet above the top of the pilothouse, where the clearance for passing under bridges will permit it. Tankships navigating the Red River of the North, Yukon, and similar rivers, and rivers whose waters flow in the Gulf of Mexico, and tankships of less than 100 gross tons may have their

whistles located not less than 2 feet above the tops of their pilothouses. Such whistles or substitutes shall be satisfactory in sound and source of power for the purpose intended.

(b) On tankships contracted for on and after November 19, 1955 means shall be provided to operate the whistle from a position adjacent to the main steering station and from the steering station on top of the pilothouse where such steering station is fitted. Details of the whistle operating devices shall meet the requirements of Subparts 113.05 and 113.65 of Subchapter J (Electrical Engineering) of this chapter.

32.15–10 Sounding machines—T/OCL. All mechanically propelled vessels in ocean or coastwise service of 500 gross tons and over, and all mechanically propelled vessels in Great Lakes service of 500 gross tons and over certificated for service on the River St. Lawrence eastward of the lower exit of the St. Lambert Lock at Montreal, Canada, shall be fitted with an efficient mechanical or electronic deep-sea sounding apparatus and a deep-sea hand lead. All other mechanically propelled vessels in Great Lakes service of 1,500 gross tons and over shall carry a deep-sea hand lead.

32.15–15 Anchors for seagoing barge—B/OC. (a) Every manned seagoing barge shall be equipped with at least one anchor with suitable chain or cable to be at least equivalent to the requirements of the American Bureau of Shipping rules (see Section 31.10–1 of this subchapter).

32.15–20 Radiotelegraph and radiotelephone—T/ALL. (a) Radiotelegraph and radiotelephone installations are required on certain tankships. Details of the application of these requirements, as well as the details of the installations, shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission.

(b) For the communication system required with the radiotelegraph and radiotelephone installations on a tankship contracted for on or after November 19, 1955 see Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter.

32.15–25 Radio direction finder—T/OC. (a) All tankships of 1,600 gross tons and over on an international voyage or in ocean service shall be fitted with a radio direction finder. Details of the installation shall be as required by the statutes and regulations under the jurisdiction of the Federal Communications Commission. Such tankships of over 1,600 gross tons, but not over 5,000 gross tons, construction or conversion of which was started prior to November 19, 1952, need not meet the requirements of this section until November 19, 1954.

(b) For the communication system required with the radio direction finder installation on a tankship contracted for on or after November 19, 1955 see Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter.

SUBPART 32.20—EQUIPMENT INSTALLATIONS

32.20–1 Equipment installations on vessels during World War II—TB/ALL. Boilers, pressure vessels, machinery, piping, electrical and other installations, including lifesaving, firefighting and other safety equipment, installed on vessels during the Unlimited National Emergency declared by the President on May 27, 1941, and prior to the termination of Title V of the Second War Powers Act, as extended (Sec. 501, 56 Stat. 180, 50 U. S. C. 635), which do not fully meet the detailed requirements of the regulations in this chapter, may be continued in service if found to be satisfactory by the Commandant for the purpose intended. In each instance prior to final action by the Commandant, the Officer in Charge, Marine Inspection, shall notify Headquarters of the facts in the case, together with recommendations relative to suitability for retention.

32.20–5 Pressure vacuum relief valves—TB/ALL. The pressure vacuum relief valve shall be of a type and size approved by the Commandant for the purpose intended. For specifications and procedures re approval, see Subpart 162.017 of Subchapter Q (Specifications) of this chapter.

32.20–10 Flame Arresters—TB/ALL. Flame arrester shall be of a type and size approved by the Commandant for the purpose intended. For specifications and procedures re approval, see Subpart 162.016 of Subchapter Q (Specifications) of this chapter.

32.20–20 Liquid level gaging—T/ALL. On tankships, the construction or conversion of which is started on or after July 1, 1951, a method for determining the level of the liquid in a cargo tank without opening ullage holes, cargo hatches, or Butterworth plates, shall be provided on all tankships certificated for the carriage of Grade A liquids: *Provided*, That ullage holes fitted with sounding pipes tightly secured to the underside of the tank tops, opens at the bottom, and extending to within 18 inches or less of the bottom of the tank shall be considered as complying with the foregoing requirement.

SUBPART 32.25—GENERAL ALARM SYSTEMS

32.25–1 Alarm bells for tankships constructed on or after September 15, 1943—T/ALL. (a) All tankships of over 100 gross tons, the construction of which is begun on or after September 15, 1943, shall have all sleeping accommodations and machinery spaces equipped with a sufficient number of alarm bells so located as to warn all occupants.

(b) Four manually operated contact makers shall be provided in accessible locations for operat-

ing the general alarm system. The contact makers shall be provided at the following locations:

(1) Wheelhouse;

(2) Space where feeder distribution panel is located;

(3) Deck officers' quarters furthest from the engineroom; and

(4) Engineroom.

(c) The alarm system installation shall meet the requirements of Subparts 113.05 and 113.25 of Subchapter J (Electrical Engineering) of this chapter, except that vessels the construction of which was started prior to November 19, 1955, need only meet the requirements of Section 113.25-90 thereof and the number and location of the contact makers shall comply with Paragraph (b) of this section.

32.25-5 Alarm bells for tankships constructed prior to September 15, 1943—T/ALL. (a) All tankships, the construction of which was begun prior to September 15, 1943, shall have all sleeping accommodations equipped with a sufficient number of alarm bells so located as to warn all the occupants. The alarm bells, if electric, shall be operated from an open switch from the pilothouse or bridge. The bells shall be of such size, character, and construction as to provide an alarm throughout the spaces for which they are provided.

(b) The alarm system installation shall meet the requirements of Section 113.25-90 of Subchapter J (Electrical Engineering) of this chapter.

32.25-10 Alarm bells for manned barges—B/OC. Each tank barge of over 100 gross tons, where the crew is divided into watches for the purpose of steering the vessel, shall be provided with a suitable alarm bell installation.

SUBPART 32.30—SOUND POWERED TELEPHONE, VOICE TUBE, AND ENGINE ORDER TELEGRAPH SYSTEMS

32.30-1 Voice tubes or telephone equipment—T/ALL. (a) Tankships shall be equipped with an efficient means of communication between the pilothouse and (1) the engineroom, (2) the steering gear room, and (3) the emergency steering station.

(b) Where tankships are equipped with a gyro compass system and/or radar plan position indicator, an efficient means of communication shall be provided between the pilothouse and the master compass and/or radar plan position indicator when such equipment is remotely located from the pilothouse.

(c) Where tankships are equipped with a radio and/or a radio direction finder, an efficient means of communication shall be provided between the pilothouse and this equipment as covered in Paragraph 113.30-5 (e) of Subchapter J (Electrical Engineering) of this chapter when such equipment is remotely located from the pilothouse.

(d) The efficient means of communication referred to in this section shall be either a voice tube or sound powered telephone system.

(e) Telephone and voice tube equipment and the installation thereof shall meet the requirements of Subparts 113.05 and 113.30 of Subchapter J (Electrical Engineering) of this chapter except that tankships the construction of which was started prior to November 19, 1955, need only meet the requirements of Section 113.30-90.

32.30-5 Engine order telegraph equipment—T/ALL. (a) Tankships shall be equipped with an efficient means of transmitting engine orders from the pilothouse to the engineroom and of transmitting acknowledgments of such engine orders from the engineroom to the pilothouse.

(b) The efficient means of transmitting engine orders and installation of the equipment shall meet the requirements of Subparts 113.05 and 113.35 of Subchapter J (Electrical Engineering) of this chapter except that tankships the construction of which was started prior to November 19, 1955, need meet only the requirements of Section 113.35-90.

32.30-10 Inspections—T/ALL. All communication equipment between the pilothouse, engineroom, steering gear room, and the emergency steering station shall be inspected and tested in accordance with the requirements of Subparagraphs 111.05-10 (c) (16) and (d) (1) of Subchapter J (Electrical Engineering) of this chapter.

SUBPART 32.35—MAIN AND AUXILIARY MACHINERY

32.35-1 Boilers and machinery—TB/ALL. Boilers, main and auxiliary machinery, and piping systems shall conform to the requirements of Subchapter F (Marine Engineering) of this chapter, except as otherwise provided for in this subchapter.

32.35-5 Installation of internal combustion engines—TB/ALL. Each internal combustion engine located on the weather deck shall be provided with a ventilated metal hood or, where space permits, with a well-ventilated metal housing of sufficient size to allow for proper operation and maintenance.

32.35-10 Steering apparatus on tank vessels—TB/ALL. Tank vessels shall be provided with steering apparatus as required by Part 58 of Subchapter F (Marine Engineering) of this chapter.

SUBPART 32.40—ACCOMMODATIONS

32.40-1 Crew accommodations on tankships of 100 gross tons or over constructed after January 1, 1938—T/ALL. On all tankships of 100 gross tons and over, the construction of which is

begun after January 1, 1938, the minimum requirements relative to construction, location, and equipment of crew accommodations are as follows:

(a) Sleeping quarters. At least 120 cubic feet of space and not less than 16 square feet of deck areas shall be allotted to each member of the crew for sleeping purposes. In measuring sleeping quarters allotted to crews of vessels, the Officer in Charge, Marine Inspection, shall not deduct from the total volume or from the deck area any equipment contained therein which is provided for the exclusive use of the crew. Not more than one bunk shall be placed above another, and the lower bunk shall be at least 12 inches above the deck. The upper bunk shall be located as nearly as practicable midway between the lower bunk and the lower side of the deck beams overhead.

(b) Toilet and washing facilities. (1) Each such tankship shall be provided with at least one washbasin, one bathtub or shower, and one toilet for each eight members, or portion thereof, in the crew to be accommodated. The crew to be accommodated shall include all members who do not occupy rooms to which private facilities are attached.

(2) When the engineroom crew, exclusive of licensed officers and others separately provided for, exceeds eight, separate washing facilities shall be provided.

(3) Vessels contracted for after January 1, 1949, shall have the toilet rooms separate from the washrooms, and at least one washbasin shall be fitted in each toilet room.

(c) Hospital accommodations. (1) Except as specifically modified by subparagraph (4) of this paragraph, each tank vessel which in the ordinary course of its trade makes voyages of more than 3 days' duration between ports and which carries a crew of 12 or more, shall be provided with a hospital space. This space shall be situated with due regard to the comfort of the sick so that they may receive proper attention in all weathers.

(2) The hospital shall be suitably separated from other spaces and shall be used for the care of the sick and for no other purposes.

(3) The hospitals shall be fitted with berths in the ratio of 1 berth to every 12 members of the crew or portion thereof who are not berthed in single-occupancy rooms, but the number of berths need not exceed 6.

(4) On vessels in which the crew is berthed in single occupancy rooms a hospital space will not be required: *Provided*, That one room shall be designated and fitted for use as a treatment and/or isolation room. Such room shall meet the following standards:

(i) The room must be available for immediate medical use;

(ii) The room must be accessible to stretcher cases;

(iii) The room must have a single berth or examination table so arranged that it can be made accessible from both sides when necessary; and

(iv) A washbasin with hot and cold running water must be installed either in or immediately adjacent to the space and other required sanitary facilities must be conveniently located.

(d) Location, construction and equipment. (1) Crew accommodations shall not be located forward of the collision bulkhead, or where there will be undue risk to members of the crew in getting to stations.

(2) Where crew quarters abut galley, boiler, or engineroom bulkheads, such bulkheads shall be insulated with fire-resistive material to reduce transmission of heat.

(3) Insofar as practicable, crew quarters shall be so located or constructed that they will be protected against objectionable odors of cargo, fuel tanks, paint lockers, oil rooms, bilges, toilets, etc.

(4) All crew spaces shall be adequately lighted, heated and ventilated. The lighting shall comply with the requirements of Section 111.50–15 and Subpart 111.60 of Subchapter J (Electrical Engineering) of this chapter.

(5) Bare metal surfaces of ship's sides and metal weather decks overhead which are not decked over with wood externally, shall be covered with suitable fire-resistive material to aid in keeping the crew's quarters dry.

(6) In the ventilation of crew accommodations provisions shall be made for the ingress of fresh air and for the egress of impure air; it shall be adequate for the purpose intended, and so arranged as to be effective in any ordinary weather conditions, and to distribute fresh air without undue discomfort to the occupants. Where natural ventilation is provided, each inlet shall have an area of at least 6 square inches for each person accommodated, the outlet to be at least equal in size to the inlet. In no case shall any one such inlet or outlet have a cross sectional area of less than 24 square inches.

(7) Mechanical ventilation may be provided if such system is equal in effectiveness to the requirements for natural ventilation and is approved by the Commandant. For remote control of mechanical ventilation see Section 111.50–5 of Subchapter J (Electrical Engineering) of this chapter.

(8) Messrooms shall be provided for both officers and crew, and shall be separate from each other where space and conditions will permit. Such messrooms shall be sufficient in size to accommodate all persons allotted to such space: *Provided, however*, That this subparagraph need not apply to vessels operating on the Great Lakes, lakes, bays and sounds, or rivers.

(9) All washbasins, shower baths, or tubs required by the regulations in this subchapter shall be equipped with proper plumbing, including hot

and cold running water. Washbasins for the crew may be located in the crew's sleeping quarters, if properly installed, equipped with proper plumbing for draining and supplied with hot and cold running water.

(10) All toilets shall be installed and equipped with the proper plumbing for flushing. Where more than one toilet is located in a space or compartment, each toilet shall be separated with a screen constructed of fire-resistive material to afford privacy. Such screens may be installed so as to be open at top and bottom for ventilation purposes.

(11) Floors of toilets and washrooms shall be covered with cement, tile, or other suitable covering.

(12) On each such tankship there shall be provided at least one sink or other suitable means for washing clothes.

(13) Each hospital shall have a toilet, washbasin, and bathtub or shower conveniently situated.

(14) A clothes locker shall be provided for each person accommodated of a size not less than 12″ x 21″ x 5′ high and so placed as to be readily accessible.

(15) Living accommodations shall be properly screened to exclude insects.

32.40–5 Crew accommodations on tankships of less than 100 gross tons and manned tank barges constructed after January 1, 1938—TB/ALL. All tankships of less than 100 gross tons and all manned tank barges, the construction of which is begun after January 1, 1938, shall be provided with crew accommodations of sufficient size, adequate construction, and with suitable equipment to provide for the protection and accommodations of its crew in a manner practicable for the size, facilities and service of the vessel, and consistent with the principles underlying the requirements for crew accommodations on tankships of 100 gross tons or more.

32.40–10 Crew accommodations on tankships of 100 gross tons or over constructed after March 4, 1915, and prior to January 1, 1938—T/ALL. On all tankships of 100 gross tons or over the construction of which was begun after March 4, 1915, and prior to January 1, 1938, the crew accommodations shall be of a character and number in compliance with Paragraphs 32.40–1 (a), (b), (c), except that separate washing facilities are not required where the engineroom crew, exclusive of licensed officers, and others separately provided for, does not exceed 10. In cases where an improvement is necessary in the sanitary conditions of such vessels, Paragraph 32.40–1 (d) will also apply in principle insofar as space and conditions will permit.

32.40–15 Crew accommodations on tankships and manned tank barges not otherwise provided for—TB/ALL. All tankships and all manned tank barges not heretofore provided for shall have crew quarters and washing and toilet facilities in keeping with the age, size, facilities and service of the vessel, and suitable for the accommodations and protection of the crew.

SUBPART 32.45—ELECTRICAL INSTALLATIONS

32.45–1 Requirements for tank vessels the construction or conversion of which is contracted for on or after November 19, 1955—TB/ALL. (a) *Application.* The requirements of this section apply to all tank vessels contracted for on or after November 19, 1955.

(b) *Additional requirements.* Additional requirements are contained in Subchapter J (Electrical Engineering) of this chapter.

(c) *Cable location.* Where practicable, electric cable shall be located well inboard from the sides, preferably along or near the center line, to reduce the risk of injury in the event of collision, but it shall be kept clear of cargo tank openings. Specific additional cable location requirements for cargo handling rooms and enclosed spaces immediately above or adjacent to cargo tanks are contained in paragraph (f) (3) of this section.

(d) *Portable equipment.* Illumination may be obtained in any compartment by the use of approved explosion-proof, self-contained, battery-fed lamps. Otherwise, no portable electrical equipment of any type shall be used in bulk cargo tanks, fuel oil tanks, cargo handling rooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(1) The compartment itself is gasfree.

(2) The compartments adjacent and diagonally adjacent are either (i) gasfree, (ii) inerted, (iii) filled with water, (iv) contain Grade E liquid and are closed and secured, or (v) are spaces in which flammable vapors and gases normally are not expected to accumulate; and,

(3) All other compartments of the vessel in which flammable vapors and gases normally may be expected to accumulate are closed and secured.

(e) *Explosion-proof installations.* Where explosion-proof equipment is required, the equipment and installation thereof shall comply with Section 111.60–40 of Subchapter J (Electrical Engineering) of this chapter.

(f) *Installation requirements on tank vessels handling Grade A, B, C, or D liquid cargo.* The requirements of this paragraph apply only to tank vessels handling Grade A, B, C, or D liquid cargo.

(1) *Equipment location.* Power devices, switchboards, distribution panels, switches, fuses, and other circuit interrupting devices shall not be installed in cargo handling rooms nor in enclosed spaces immediately above or adjacent to cargo tanks. Storage batteries shall not be located in cargo handling rooms.

(2) *Lighting.* Lighting in cargo handling rooms shall be accomplished either through permanently fixed glass lenses fitted in the bulkhead and/or overhead, or by the use of explosion-proof fixtures when specifically approved by the Commandant. For detailed requirements see Paragraph 111.70–10(c) of Subchapter J (Electrical Engineering) of this chapter.

(3) *Cable.* Through runs of electric cable, regardless of how they may be protected, are prohibited in cargo handling rooms, except where permitted by Section 111.65–3 of Subchapter J (Electrical Engineering) of this chapter. In any enclosed space immediately above or adjacent to cargo tanks other than cargo handling rooms, through runs of electric cable are permitted.

(4) *Weather decks.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo handling room doors or cargo handling room ventilation outlets, or cargo tank vent terminations shall be explosion-proof. Explosion-proof equipment installed in locations exposed to the weather shall be watertight or shall be enclosed in watertight housings, or protected against the entrance of water by other approved means.

(5) *General cargo spaces.* General cargo spaces located beyond the segregation spaces of tank vessels carrying Grade A, B, C, or D liquid cargo shall have no special restrictions in regard to electrical installations.

(g) *Installation requirements on vessels handling Grade E liquid cargo.* The requirements of this paragraph apply only to vessels handling Grade E liquid cargo.

(1) *Electrical installations.* There are no restrictions in regard to the electrical installations in cargo handling rooms and enclosed spaces of tank vessels carrying only Grade E liquid cargo, except that storage batteries shall not be located in cargo handling rooms.

(h) *Cargo pumproom handling Grade A, B, C, or D liquid cargo.* (1) Lighting in cargo pumprooms handling Grade A, B, C, or D liquid cargo shall be accomplished either through permanently fixed glass lenses fitted in the bulkhead and/or overhead, or by the use of explosion-proof fixtures, except that explosion-proof fixtures may be installed only under certain conditions. For detail requirements see Paragraph 111.70–10(c) of Subchapter J (Electrical Engineering) of this chapter.

(2) Through runs of electric cable regardless of how they may be protected, are prohibited, except that cables which are a part of the intrinsically safe circuitry of an approved installation are specifically exempt from this restriction.

(i) *Weather decks of tank vessels handling Grade A, B, C, or D liquid cargo.* Motors, their control equipment, and other electrical equipment and installations located on or above the weather decks within 10 feet of the cargo tank openings, cargo pumproom doors or cargo pumproom ventilation outlets, or cargo tank vent terminations shall be explosion-proof. Explosion-proof equipment installed in locations exposed to the weather shall be watertight or shall be enclosed in watertight housings, or protected against the entrance of water by other approved means.

32.45–5 Requirements for tank vessels the construction or conversion of which was started on or after November 10, 1936 but prior to November 19, 1955—TB/ALL—(a) Application. The requirements of this section shall apply to all tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to November 19, 1955.

(b) General. The electrical installation shall be in accordance with this section, and to the extent that such installation is not covered by this section it shall be at least equivalent to the Commandant's general requirements.

(c) Existing arrangements. Existing arrangements, materials, and facilities previously approved will be considered satisfactory so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. For detailed requirements see Paragraph 111.70–90 (a) of Subchapter J (Electrical Engineering) of this chapter minor repairs and minor alterations may be made to the same standard as the original installation.

(d) New installations. New installations or major replacements shall meet the applicable requirements of Section 32.45–1.

(e) Location of storage batteries. Storage batteries shall not be located in cargo pumprooms. The space in which they are located shall be well ventilated and they shall be protected against mechanical and electrical injury including short circuiting and overloading. Batteries shall be secured against movement, and acid batteries shall be set in lead-lined trays at least 3 inches deep of at least 4-pound sheet lead.

(f) Installations made during the Unlimited National Emergency. Electrical equipment installed during the Unlimited National Emergency as defined in Section 110.25–5 of Subchapter J (Electrical Engineering) of this chapter and not complying with the requirements in this subchapter may be continued in service if found to be satisfactory by the Commandant for the purpose intended.

(g) Cargo pumprooms and enclosed spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955—(1) Appli-

cation. The requirements of this paragraph shall apply to cargo pumprooms and enclosed spaces immediately above the bulk cargo tanks of tank vessels carrying Grade A, B, C or D liquid cargo, the construction or conversion of which vessels was started on or after July 1, 1951, but prior to November 19, 1955. There are no special restrictions in regard to the electrical installations in cargo pumprooms and enclosed spaces of tank vessels carrying only Grade E liquid cargo.

(2) Cable location. Through runs of electric cable are permitted.

(3) Equipment. No electric lighting or power circuit interrupting or power devices shall be installed in pumprooms. Enclosed spaces immediately above the bulk cargo tanks shall contain no electrical circuit interrupting or power devices.

(4) Lighting. Lighting shall be effected by means of approved explosion–proof or magazine type lighting fixtures. When the vessel is not gas free no portable lighting equipment shall be used except approved explosion–proof, self-contained, battery-fed lamps.

(h) General cargo spaces of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955 and carrying Grade E liquid cargo only. General cargo spaces, regardless of location, of tank vessels constructed on or after July 1, 1951, but prior to November 19, 1955, and carrying Grade E liquid cargo only, shall have no special restrictions in regard to electrical installations.

(i) Cargo pumprooms and enclosed spaces of tank vessels constructed on or after November 10, 1936, but prior to July 1, 1951—(1) Application. The requirements of this paragraph shall apply to cargo pumprooms for Grade A, B, C or D liquids and to enclosed spaces required to segregate Grade A, B, C or D liquid cargo tanks from other spaces, all on tank vessels the construction or conversion of which was started on or after November 10, 1936, but prior to July 1, 1951.

(2) General. The installation covering the cable. cable fittings and method of making wiring connections, lighting fixtures, and motors shall comply with the requirements of Paragraph 111.70–90 (d) of Subchapter J (Electrical Engineering) of this chapter.

(3) Ventilation. The motor-driven ventilation system for the cargo pump motor when located in the pumproom is to be so interlocked that the pump motor cannot be started prior to a circulation of air. The air ducts are to lead to and from the atmosphere outside the pumproom and are to terminate not less than 3 feet above the deck and not less than 6 feet from any cargo tank vent. (See Section 32.60–20.)

32.45–10 Requirements for tank vessels the construction or conversion of which was started prior to November 10, 1936—TB/ALL—(a) Application. The requirements of this section shall apply to all tank vessels the construction or conversion of which was started prior to November 10, 1936.

(b) General. The electrical installation shall be maintained in a safe and in a good mechanical condition, and shall comply with the regulations in effect when the vessel was built, or to the requirements of a recognized classification society. Any major change in the electrical installation or any conversion shall comply with the requirements of this subpart applicable to new vessels.

(c) Pumprooms and enclosed spaces of tank vessels handling Grade A, B, C or D liquid cargo. The electrical installation in the pumprooms and enclosed spaces immediately adjoining cargo tanks (except in pump enginerooms as provided in Section 32.70–20) of tank vessels handling Grade A, B, C or D liquid cargo shall be made to comply with Paragraphs 32.45–1 (b) and (c), 32.45–5 (b) and (g) and sections 111.55–1, 111.55–15 and 111.60–5 of Subchapter J (Electrical Engineering) all of this chapter, to the extent that the changes are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interest of safety.

SUBPART 32.50—PUMPS, PIPING, AND HOSE FOR CARGO HANDLING

32.50–1 Cargo pumps for tank vessels constructed on or after November 10, 1936—TB/ALL. On all tank vessels, the construction or conversion of which is started on or after November 10, 1936, the cargo pumps shall be designed and installed to minimize the danger of sparking. Special care shall be exercised in the design of packing spaces in order to secure ample depth and accessibility of glands. Where cargo pump shafts pierce gastight bulkheads, stuffing boxes with readily accessible gastight glands shall be provided.

32.50–3 Cargo discharge—TB/ALL. (a) Pumps or other acceptable means shall be used to discharge cargo from gravity type cargo tanks vented at gauge pressures of 4 pounds per square inch or less.

(b) The use of compressed air as the primary means of discharging cargo from such tanks is prohibited.

32.50–5 Cargo pump fittings and controls on tank vessels constructed on or after November 10, 1936—TB/ALL. (a) On all tank vessels, the construction or conversion of which is started on or after November 10, 1936, where a cargo pump is capable of developing a pressure exceeding 125 pounds at the pump under shutoff head conditions (based on water), a suitable relief valve shall be installed between the pump and shutoff valve in the cargo pump discharge and piped back into the

suction. The relief valve setting shall not exceed the pressure for which the piping system is designed.

(b) A pressure gage shall be installed for each pump discharge, and it shall be located at a point visible with respect to the pump controls.

32.50–10 Cargo pumps on tank vessels with independent cargo tanks which were constructed prior to November 10, 1936—TB/ALL. (a) Cargo pumps on tank vessels, the construction or conversion of which was started prior to November 10, 1936, may be located in a hold space containing independent cargo tanks or on deck. If the pump driving unit is of the type permitted in cargo pumprooms, it also may be located in the hold space. If other types of driving units are used, they shall be located on deck or in an engine compartment. If the pump drive shaft passes through decks or bulkheads into a hold space or pumproom, it shall be provided with suitable stuffing boxes at such points.

32.50–15 Cargo piping on tank vessels constructed on or after July 1, 1951—TB/ALL. (a) On all tank vessels, the construction or conversion of which is started on or after July 1, 1951, the cargo piping shall be:

(1) A fixed cargo piping system shall be installed on a tank vessel carrying Grade A, B, or C cargo. The piping shall be arranged so as to avoid excessive stresses at the joints. For sizes exceeding 2 inches in diameter, flanged, welded, or other approved types of joints shall be employed. Packing material shall be suitable for the cargo carried. Connections at bulkheads shall be made so that the plating does not form part of a flanged joint. Piping may be carried through bunker spaces and deep tanks provided it is run through a pipe tunnel. The tunnel may be omitted where the pipe is extra heavy, all joints are welded, and bends are installed to provide for expansion and contraction.

(2) Cargo piping, where installed in tank vessels carrying Grade D or E cargo only, shall conform with the requirements contained in Subparagraph (1) of this paragraph.

(3) Cargo piping shall not pass through spaces containing machinery where sources of vapor ignition are normally present: *Provided*, That, in special cases the Commandant may permit the piping to pass through such spaces if Grade E liquids only are involved.

(b) Valve operating rods in cargo tanks shall be solid, except that tank barges having plug cocks inside the cargo tanks may have operating rods of extra heavy pipe with the annular space between the lubricant tube and the pipe wall sealed with a nonsoluble material to prevent penetration of the cargo. Valve operating rods shall be of ample size, well guided and supported, and attached to the valve stems in a manner so as to prevent the operating rods from working loose. Where the operating rods pass through a deck, gastight stuffing boxes shall be fitted. The leads of operating rods shall be as direct as possible. Valves shall be of suitable design for the intended service.

(c) All cargo loading and discharge hose connections shall be fitted with valves or blind flanges.

32.50–20 Cargo piping for tank vessels constructed between November 10, 1936, and July 1, 1951—TB/ALL. (a) On tank vessels, the construction or conversion of which is started on or after November 10, 1936, and prior to July 1, 1951, the piping shall be arranged so as to avoid excessive stresses at the joints. For sizes exceeding 2 inches in diameter, flanged, welded, or other approved types of joints shall be employed. Packing material shall be suitable for the cargo carried. Connections at bulkheads shall be made so that the plating does not form part of a flanged joint. Piping may be carried through bunker spaces and deep tanks provided it is run through a pipe tunnel. The tunnel may be omitted where the pipe is extra heavy, all joints are welded, and bends are installed to provide for expansion and contraction.

(b) Cargo piping shall not pass through spaces containing machinery where sources of vapor ignition are normally present: *Provided*, That in special cases the Commandant may permit the piping to pass through such spaces if Grade E liquids only are involved.

(c) Valve operating rods in the cargo tanks shall be solid and of ample size, well guided and supported, and attached to the valve stems in a manner to guard against their working loose. Where such valve rods pass through the deck, gastight stuffing boxes shall be fitted. The leads of valve rods shall be as direct as possible. All valves and fittings shall be of material, design, and manufacture for the intended service on the cargo system; either rising or nonrising stem valves may be used.

32.50–25 Cargo pumps and piping on tank vessels constructed prior to November 10, 1936—TB/ALL. On tank vessels, the construction or conversion of which was started prior to November 10, 1936, cargo pumps and piping which do not fully comply with the regulations in this subchapter shall be made as nearly equal to the requirements for tank vessels constructed between November 10, 1936, and July 1, 1951, as is necessary in the interest of safety. Cargo pipe lines may pass through cargo pump engine compartments provided no cargo valves are located therein.

32.50–30 Cargo hose—TB/ALL. Cargo hose, when carried on tank vessels, shall be of a grade suitable for oil service, and shall be designed to withstand the pressure of the shutoff head of the cargo pump or pump relief valve setting, less static head, but in no case less than 100 pounds per square inch.

32.50–35 Remote manual shutdown for internal combustion engine driven cargo pump on tank vessels—TB/ALL. (a) Any tank vessel which is equipped with an internal combustion engine driven cargo pump on the weather deck shall be provided with a minimum of one remote manual shutdown station, conspicuously marked, and located at the midpoint of such vessel, or 100 feet from the engine, whichever is the more practical. The remote quick acting manual shutdown shall be installed on the engine so as to provide a quick and effective means of stopping the engine (such as by cutting off the intake air).

(b) This regulation applies to all installations of this type on tank vessels, but for such installations now on existing tankships at the date of next biennial inspection or October 1, 1963, whichever occurs later.

SUBPART 32.52—BILGE SYSTEMS

32.52–1 Bilge pumps on tank vessels constructed or converted on or after November 19, 1952—TB/ALL. The number and arrangement of bilge pumps on each tank vessel shall conform to the requirements of Subchapter F (Marine Engineering) of this chapter, except as hereinafter provided in this subpart.

32.52–5 Bilge piping for pumprooms and adjacent cofferdams on tank vessels constructed or converted on or after November 19, 1952—TB/ALL. (a) Provisions shall be made for removing drainage from the pumproom bilges and adjacent cofferdams. A separate bilge pump, ejector, or bilge suction from a cargo pump or cargo stripping pump may be provided for this purpose. The bilge pump shall not be located in nor shall the piping pass through spaces containing machinery where sources of vapor ignition are normally present.

(b) Where a bilge suction is provided from a cargo or stripping pump, a stop-check valve shall be fitted in the suction branch, and an additional stop valve shall be fitted also if the bilge suction branch can be subjected to a head of oil from the filling line.

(c) Means shall be provided for controlling the cargo or pumproom bilge pumps and their suctions or discharges in order that a flooded pumproom may be pumped out. Suitable portable or manually operated pumps may be accepted as complying with this provision, or alternatively, the pump controls shall be arranged so that they are operable from inside the pumproom and either from an accessible position outside the pumproom, or from the pumproom casing above the freeboard deck.

32.52–10 Bilge pumps and piping on tank vessels constructed or converted prior to November 19, 1952—TB/ALL. (a) On tank vessels, the construction or conversion of which was started prior to November 19, 1952, bilge pumps and piping which do not fully comply with the regulations of this subchapter shall be made as nearly equal to the requirements for tank vessels constructed on or after November 19, 1952, as is necessary in the interest of safety.

(b) Bilge suctions from hold spaces containing independent cargo tanks may be connected to cargo pumps or stripping pumps, provided the installation complies with the requirements of Paragraph 32.52–5 (b).

SUBPART 32.55—VENTILATION AND VENTING

32.55–1 Ventilation of tank vessels constructed on or after July 1, 1951—TB/ALL. (a) On all tank vessels, the construction or conversion of which is started on or after July 1, 1951, all enclosed parts of the vessel, other than cargo, fuel and water tanks, cofferdams and void spaces, shall be provided with efficient means of ventilation.

(b) Compartments containing machinery where sources of vapor ignition are normally present shall be ventilated in such a way as to remove vapors from points near the floor level or the bilges. Effective steam or air actuated gas ejectors, blowers or ventilators fitted with heads for natural ventilation, with at least one duct extending to immediately below the floorplates will be approved for this purpose. Machinery spaces below the freeboard deck, in which fuels with flashpoint of 110° F. or lower are used, shall be equipped with power ventilation. (See Section 32.60–20 for other requirements concerning pumprooms.)

32.55–5 Ventilation of tank vessels constructed between November 10, 1936, and July 1, 1951—TB/ALL. (a) On tank vessels, the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951, all enclosed parts of the vessel, other than cargo, fuel, and water tanks and cofferdams, shall be provided with efficient means of ventilation.

(b) Pumprooms and compartments containing machinery where sources of vapor ignition are normally present shall be ventilated in such a way as to remove vapors from points near the floor level or the bilges. Effective steam or air actuated gas ejectors or blowers or ventilators fitted with heads for natural ventilation, will be approved for this purpose. (See Section 32.65–20 for other requirements concerning pumprooms.)

32.55–10 Ventilation of tank vessels contracted prior to November 10, 1936—TB/ALL. Ventilation of tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall be equal to the requirements of tank vessels constructed before July 1, 1951, where the changes are, in the opinion of the Officer in

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Charge, Marine Inspection, necessary in the interest of safety.

32.55-15 Ventilation for hold spaces—TB/ALL. Hold spaces containing independent cargo tanks shall be considered to be equivalent to cargo pumprooms and shall be ventilated and safeguarded as such.

32.55-20 Venting of cargo tanks of tankships constructed on or after July 1, 1951—T/ALL—(a) Venting required. (1) On all tankships, the construction or conversion of which is started on or after July 1, 1951, each cargo tank shall be equipped with a vent. The diameter of a vent shall be not less than 2½ inches.

(2) In any case where a venting system is required for a particular grade of liquid, the venting system permitted for a higher grade of liquid may be used instead.

(b) Grade A liquids. (1) Cargo tanks in which Grade A liquids are to be transported shall be fitted with a venting system consisting of a branch vent line from each cargo tank connected to a vent header which shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of ignition. When special conditions will prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height of one-third the beam of the vessel.

(2) A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(3) The branch vent lines shall consist of either:

(i) Pipe with no valves or other hindrances to a free flow of gas: or,

(ii) Piping fitted with a pressure vacuum relief valve, provided means are supplied for relieving all internal pressure on cargo tanks by fitting the valve with a positive means for opening its pressure valve to allow free passage of gases through the branch vent line or by the installation of a bypass fitted with a manually operated stop valve.

(4) The vent header shall be fitted with a flame arrester or pressure vacuum relief valve. If a pressure vacuum relief valve is used in the header, means shall be provided for relieving all internal pressure on cargo tanks by fitting the valve with a positive means for opening its pressure valve to allow free passage of gases through the header or by the installation of a bypass fitted with a manually operated stop valve. A suitable means of relieving pressure shall be fitted in the header in order to prevent excess pressure being built up in the tanks, in the event of overfilling of the latter. The vent header system shall be provided with suitable connections for flushing and draining. The vent header system shall be of sufficient capacity as to be able to carry off all displaced air and vapors during loading of the cargo tanks without opening of ullage plates, cargo hatches, etc. See Section 32.20-20 for liquid level gaging requirements.

(c) Grade B or C liquids. Cargo tanks in which Grade B or C liquids are to be transported shall be fitted with either individual pressure-vacuum relief valves which shall extend to a reasonable height above the weather deck or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or a pressure-vacuum relief valve. The vent header system, if fitted, shall be provided with suitable connections for flushing and draining, and if desired, stop valves may be placed in the individual branch vent lines provided that each stop valve is bypassed by a pressure-vacuum relief valve.

(d) Grade D or E liquids. Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens.

32.55-25 Venting of cargo tanks of tank barges constructed on or after July 1, 1951—B/ALL—(a) Venting required. (1) On all tank barges, the construction or conversion of which is started on or after July 1, 1951, each cargo tank shall be equipped with a vent. The diameter of a vent shall be not less than 2½ inches.

(2) In any case where a venting system is required for a particular grade of liquid, the venting system permitted for a higher grade of liquid may be used instead.

(b) Grade A, B, or C liquids. Cargo tanks in which Grade A, B, or C liquids are to be transported shall be fitted with either individual pressure-vacuum relief valves which shall extend to a reasonable height above the weather deck or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a pressure-vacuum relief valve. The vent header system, if fitted, shall be provided with suitable connections for flushing and draining, and if desired, stop valves may be placed in the individual branch vent lines: *Provided*, That each such stop valve is bypassed by a pressure-vacuum relief valve.

(c) Grade D or E liquids. Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens.

32.55-30 Venting of cargo tanks of tank vessels constructed between November 10, 1936,

and July 1, 1951—TB/ALL—(a) Venting required. On all tank vessels, the construction or alteration of which is started on or after November 10, 1936, and prior to July 1, 1951, each cargo tank shall be equipped with a vent. The details of the venting system shall meet the requirements of this section, or alternatively, the requirements of either Section 32.55–20 or Section 32.55–25, as applicable, shall be met.

(b) Grade A liquids. (1) Cargo tanks in which Grade A liquids are to be transported shall be fitted with a venting system consisting of branch vent line from each cargo tank connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or pressure-vacuum relief valve. Each branch vent line may be provided with a manually operated control valve, provided it is bypassed with a pressure-vacuum relief valve or each cargo tank to which such a branch vent line is connected is fitted with an independent pressure-vacuum relief valve. The vent header system shall be provided with suitable connections for flushing and draining.

(2) In barges with independent tanks carrying Grade A liquids, separate discharge pipes may be fitted to each pressure-vacuum relief valve, or the pressure-vacuum relief valve may be elevated, so that in either case the discharge from such valve will not be less than 7 feet above the deck where practicable.

(c) Grade B or C liquids. Cargo tanks in which Grade B or C liquids are to be transported shall be fitted with individual pressure-vacuum relief valves or shall be fitted with a venting system consisting of branch vent lines connected to a vent header which shall extend to a reasonable height above the weather deck and be fitted with a flame arrester or a pressure-vacuum relief valve.

(d) Grade D or E liquids. Cargo tanks in which Grade D or E liquids only are to be transported shall be fitted with gooseneck vents and flame screens unless such tanks are vented by pressure-vacuum relief valves or a venting system of branch vent lines and a vent header.

32.55–35 Venting of cargo tanks on tank vessels constructed prior to November 10, 1936—TB/ALL. The venting of cargo tanks of tank vessels, the construction or alteration of which was started prior to November 10, 1936, shall be made to equal the requirements of tank vessels constructed before July 1, 1951, where the changes are, in the opinion of the Officer in Charge, Marine Inspection, necessary in the interests of safety: *Provided*, That on such vessels carrying Grade A cargo the requirements in Paragraph 32.55–30 (b) shall be met.

32.55–40 Venting of cargo tanks fitted with inert-gas system—TB/ALL. A tank vessel equipped with an approved system for maintaining all cargo tank vapor spaces nonflammable shall be accepted in lieu of the requirements of Sections 32.55–20, 32.55–25, 32.55–30 or 32.55–35.

32.55–45 Venting of cofferdams and void spaces of tank vessels constructed on or after November 10, 1936—TB/ALL. (a) Except as provided in paragraph (b) of this section, on all tank vessels, the construction or conversion of which was started on or after November 10, 1936, cofferdams and void spaces shall be provided with gooseneck vents fitted with a flame screen or pressure-vacuum relief valves. The diameter of a vent shall be not less than 2½ inches.

(b) On unmanned tank barges not fitted with fixed bilge systems in the cofferdams and void spaces, vents for cofferdams and void spaces will not be required.

SUBPART 32.57—STRUCTURAL FIRE PROTECTION FOR TANK VESSELS CONTRACTED FOR ON OR AFTER JANUARY 1, 1963

32.57–1 Application — TB/ALL. (a) The provisions of this subpart shall apply to all tank vessels contracted for on or after January 1, 1963.

32.57–5 Definitions — TB/ALL. (a) *Standard fire test.* A "standard fire test" is one which develops in the test furnace a series of time temperature relationships as follows:

5 minutes—1,000° F.
10 minutes—1,300° F.
30 minutes—1,550° F.
60 minutes—1,700° F.

(b) *"A" Class divisions.* Bulkheads or decks of the "A" Class shall be composed of steel or equivalent metal construction, suitably stiffened and made intact with the main structure of the vessel; such as shell, structural bulkheads, and decks. They shall be so constructed, that if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one hour.

(c) *"B" Class bulkheads.* Bulkheads of the "B" Class shall be constructed with approved incombustible materials and made intact from deck to deck and to shell or other boundaries. They shall be so constructed that, if subjected to the standard fire test, they would be capable of preventing the passage of flame and smoke for one half hour.

(d) *"C" Class divisions.* Bulkheads or decks of the "C" Class shall be constructed of approved incombustible materials, but need meet no requirements relative to the passage of flame.

(e) *Steel.* Where the term "steel or other equivalent metal" is used in this subpart, it is intended to require a material which, by itself or due to insulation provided, has structural and integrity qualities equivalent to steel at the end of the applicable fire exposure.

(f) *Approved material.* Where in this subpart approved materials are required, they refer to ma-

terials approved under the applicable subparts of Subchapter Q (Specifications) of this chapter, as follows:

Deck Coverings	164.006
Structural Insulations	164.007
Bulkhead Panels	164.008
Incombustible Materials	164.009
Interior Finishes	164.012

(g) *Stairtower.* A stairtower is a stairway which penetrates more than a single deck within the same enclosure.

32.57-10 Construction—TB/ALL. (a) The hull, superstructure, structural bulkheads, decks, and deckhouses shall be constructed of steel. Alternately, the Commandant may permit the use of other suitable material in special cases, having in mind the risk of fire.

(b) Bulkheads of galleys, paint and lamp lockers, and emergency generator rooms shall be of "A" Class construction.

(c) The boundary bulkheads and decks separating the accommodations and control stations from cargo, and machinery spaces and from galleys, main pantries and storerooms other than small service lockers shall be of "A" Class construction.

(d) Within the accommodation and service areas (i.e., Galleys, main pantries and storerooms other than small service lockers) the following conditions shall apply:

(1) Corridor bulkheads in accommodation areas shall be of "A" or "B" Class intact from deck to deck. Stateroom doors in such bulkheads may have a louver in the lower half.

(2) Stairtowers, elevator, dumbwaiter, and other trunks shall be of "A" Class construction.

(3) Bulkheads not already specified to be of "A" or "B" Class construction may be of "A", "B", or "C" Class construction.

(4) The integrity of any deck in way of a stairway opening, other than a stairtower, shall be maintained by means of "A" or "B" Class bulkheads and doors at one level. The integrity of a stairtower shall be maintained by "A" Class doors at every level. The doors shall be of the self-closing type. Such doors shall be fitted with a suitable kickout panel in the lower half. Holdback hooks, or other means of permanently holding the door open will not be permitted. However, magnetic holdbacks operated from the bridge or from other suitable remote control positions are acceptable.

(5) Interior stairs, including stringers and treads shall be of steel or other suitable material having in mind the risk of fire. This is not intended to preclude the use of other material for nosing, walking surfaces, etc., over the steel.

(6) Except for washrooms and toilet spaces, deck coverings within accommodation spaces shall be of an approved type. However, overlays for leveling or finishing purposes which do not meet the requirements for an approved deck covering may be used in thicknesses not exceeding $\frac{3}{8}$ of an inch.

(7) Ceilings, linings, and insulation, including pipe and duct laggins, shall be of approved incombustible material.

(8) Any sheathing, furring or holding pieces incidental to the securing of any bulkhead, ceiling, lining, or insulation shall be of approved incombustible materials.

(9) Bulkheads, linings and ceilings may have a combustible veneer within a room not to exceed $\frac{2}{28}$ of an inch in thickness. However, combustible veneers, trim, decorations, etc., shall not be used in corridors or hidden spaces. This is not intended to preclude the use of an approved interior finish or a reasonable number of coats of paint.

(e) Wood hatch covers may be used between cargo spaces or between stores spaces. Hatch covers in other locations shall be of steel or equivalent metal construction. Tonnage openings shall be closed by means of steel plates or equivalent metal construction.

(f) Nitrocellulose or other highly flammable or noxious fume-producing paints or lacquers shall not be used.

SUBPART 32.60—HULL REQUIREMENTS FOR TANK VESSELS CONSTRUCTED ON OR AFTER JULY 1, 1951

32.60-1 Scantlings, material, and workmanship—TB/ALL. (a) All tank vessels, the construction or conversion of which is started on or after July 1, 1951, shall conform to the requirements in this subpart in construction of hulls. The hull and deckhouses shall be of steel or iron construction except that the pilothouse and decks over quarters may be constructed of wood. Scantlings, material, and workmanship, subdivision of cargo spaces, fitting of cofferdams, and testing of tanks shall be at least equivalent to the requirements of the American Bureau of Shipping or other recognized classification society.

(b) See Subpart 32.57 for structural fire protection requirements for tank vessels contracted for on or after January 1, 1963.

32.60-5 Subdivision of cargo space—TB/ALL. The cargo space shall be divided into tight compartments as necessary to avoid excessive stresses and to provide stability.

32.60-10 Segregation of cargo; Grade A, B, C, or D—TB/ALL—(a) General. The galleys, living quarters, navigation spaces, general cargo spaces, boilerrooms, and enclosed spaces where sources of vapor ignition are normally present, shall be segregated from cargo tanks by cofferdams or pumprooms or tanks, either empty or used to carry liquid having a flashpoint of 150° F. or above, or deck spaces enclosed or open.

(b) Cargo tank spaces. Cargo tank spaces

shall extend to the main deck, with hatches and vents located on the weather deck. Liquids having a flashpoint of not less than 150° F. may be carried in the bulk tanks located beyond the segregating cofferdams and/or pumprooms.

CROSS REFERENCE: *See* drawing No. 1 in the Appendix.

(c) Enclosed spaces. (1) Cargo and vent piping passing through enclosed spaces immediately above the bulk cargo tanks shall be continuous except that flanged joints connecting pipe sections will be permitted.

(2) No openings to cargo tank shall be permitted other than stuffing boxes through which valve control rods or permanently installed gage tapes extend and openings for use of tank cleaning machines. Openings for tank cleaning machines, when not in use, shall be kept closed by means of gastight bolted plates and when in use shall be made essentially gas and watertight by covers through which hose or pipe to the tank cleaning machines extend.

(3) The overhead in way of quarters shall be gastight.

CROSS REFERENCE: *See* drawing No. 1 in the Appendix.

(d) Stowage spaces. The spaces described in Paragraph (c) of this section may be used for stowage purposes and for general cargo provided that adequate ventilation is furnished.

(e) Openings. Except as provided in Paragraph (c) of this section, there shall be no manholes or other openings from cargo tanks to any other enclosed spaces. Any vents, sounding tubes, and similar piping passing through such tanks shall be run in a suitable trunk.

32.60–15 Segregation of cargo; Grade E—TB/ALL—(a) General. The galleys, living quarters, navigation spaces, general cargo spaces, boilerrooms, and enclosed spaces containing machinery, where sources of vapor ignition are normally present, shall be segregated from the cargo tanks by tight bulkheads and intervening spaces are not required.

(b) Cargo tank spaces. Cargo tank spaces can be terminated at any deck with hatches on the same deck, but the vent lines shall be extended to the weather deck. Butterworth openings and extension rods may be located on the tank top.

32.60–20 Pumprooms on tank vessels carrying Grade A, B, C, D and/or E liquid cargo—TB/ALL. (a) Cargo pumps. In tank vessels carrying Grade A, B, C, or D liquid cargo, cargo pumps shall be isolated from source of vapor ignition by gastight bulkheads. A gastight bulkhead between the pumproom and the pump engineroom may be pierced for drive shaft and pump engine control rods provided such openings are fitted with stuffing boxes or other approved gland arrangement. A steam driven pump shall not be considered a source of vapor ignition provided the steam temperature does not exceed 500° F.

(b) Ventilation for pumprooms on tank vessels the construction or conversion of which is started between July 1, 1951, and January 1, 1963. (1) Pumprooms of all tank vessels, the construction or conversion of which is started between July 1, 1951, and January 1, 1963, shall be ventilated in such a way as to remove vapors from points near the floor level or bilges. Pumprooms on tankships handling Grades A, B, or C liquid cargo, with machinery located below the freeboard deck, shall be equipped with power ventilation. Pumprooms equipped with power ventilation shall have the ventilation outlets terminate more than six feet from any opening to the interior part of the vessel which normally contains sources of vapor ignition.

(2) For all tank vessels, the construction or conversion of which is started between October 1, 1959, and January 1, 1963, the power ventilation shall not produce a source of vapor ignition in either the pumproom or the ventilation systems associated with the pumproom. The capacity of power ventilation units shall be sufficient to effect a complete change of air in not more than 3 minutes, based upon the volume of the pumproom and associated trunks up to the deck at which access from the weather is provided.

(c) Ventilation for pumprooms on tank vessels the construction or conversion of which is started on or after January 1, 1963. (1) For all tank vessels, the construction or conversion of which is started on or after January 1, 1963, the cargo pumprooms shall be fitted in accordance with paragraphs (a) and (d) of this section. Cargo pumprooms on these vessels shall be ventilated in such a way as to remove vapors from points near the floor level or bilges. Cargo pumprooms on tank vessels handling Grade A, B, or C liquid cargo, shall be equipped with power ventilation of the exhaust type having capacity sufficient to effect a complete change of air in not more than 3 minutes based upon the volume of the pumproom and associated trunks up to the deck at which access from the weather is provided.

(2) The power ventilation units shall not produce a source of vapor ignition in either the pumproom or the ventilation systems associated with the pumproom. Inlets to exhaust ducts shall be provided and located near the floor level at points where concentrations of vapors may be expected. Ventilation from the weather deck shall be provided. Power supply ventilation may be fitted in lieu of natural ventilation, but when fitted shall be arranged to avoid turbulence in the cargo pumproom. Cargo pumprooms equipped with power ventilation shall have the ventilation outlets terminate more than six feet from any opening to the interior part of the vessel which normally contains sources of vapor ignition, and shall be so located as to minimize the possibility of recirculating contaminated air through the pumproom.

(3) Cargo pumprooms handling Grade D and/or E liquid cargo only shall be fitted with at least two ducts extended to the weather deck, one of which shall be extended to a point near the floor level. This does not preclude installation of power ventilation, if desired.

(d) Access. The access to a cargo pumproom in a tank vessel carrying Grade A, B, C, or D liquid cargo shall be from the open deck.

32.60–25 Living quarters—TB/ALL. (a) For living quarters the partitions and sheathing shall be of an approved fire resistive construction. The specification for incombustible materials is in Subchapter Q (Specifications) of this chapter.

(b) See Subpart 32.57 for structural fire protection for tank vessels contracted for on or after January 1, 1963.

32.60–30 Tank vessels with independent tanks—TB/ALL. (a) Independent cargo tanks may be located in hold spaces or in other cargo tanks; however, a working space of at least 15 inches shall be maintained around each independent tank, or else provisions shall be made for moving such tanks to furnish such working space, except that less than 15 inches around such tanks may be permitted if in the judgment of the Officer in Charge, Marine Inspection, having jurisdiction, a satisfactory inspection of the cargo tanks and hull structure can be made.

(b) When an independent cargo tank is located in an enclosed space other than a cargo tank, such enclosed space shall be considered as equivalent to a pumproom and shall be safeguarded as such as required by this subpart.

(c) Cargo tanks independent of the hull structure shall be supported in saddles or on foundations of steel or other suitable material and securely attached in place to preclude the cargo from being damaged or shifting as a result of collision. The arrangement shall be such as to permit longitudinal and circumferential, or athwartship and vertical, expansion of the cargo tanks. Each tank shall be supported so as to prevent the concentration of excessive loads on the supporting portion of the shell.

32.60–35 Tank vessels carrying Grade A liquid cargo—TB/ALL. Grade A liquids having a Reid vapor pressure in excess of 25 pounds per square inch shall be transported in cargo tanks which are independent of the hull.

32.60–40 Construction and testing of cargo tanks and bulkheads—TB/ALL. (a) All cargo tanks vented at gage pressure of 4 pounds per square inch or less shall be constructed and tested as required by standards established by the American Bureau of Shipping or other recognized classification society. The design of cargo tanks integral with the hull and vented at a gage pressure exceeding 4 pounds per square inch but not exceeding 10 pounds per square inch gage pressure will be given special consideration by the Commandant.

(b) Cargo tanks vented at a gage pressure exceeding 10 pounds per square inch are considered to be pressure vessels and shall be of cylindrical or similar design and shall meet the requirements of Subchapter F (Marine Engineering) of this chapter.

32.60–45 Segregation of spaces containing the emergency source of electric power—TB/ALL. (a) The provisions of this section shall apply to all vessels contracted for on or after October 1, 1958.

(b) When a compartment containing the emergency source of electric power, or vital components thereof, adjoins a space containing either the ship's service generators or machinery necessary for the operation of the ship's service generators, all common bulkheads and/or decks shall be protected by approved "structural insulation" or other approved material. This protection shall be such as to be capable of preventing an excessive temperature rise in the space containing the emergency source of electric power, or vital components thereof, for a period of at least one hour in the event of fire in the adjoining space. Bulkheads or decks meeting Class A–60 requirements, as defined by Section 72.05–10 of Subchapter H (Passenger Vessels) of this chapter, will be considered as meeting the requirements of this paragraph.

SUBPART 32.63—HULL AND CARGO TANK REQUIREMENTS FOR TANK BARGES CONSTRUCTED OR CONVERTED ON OR AFTER JULY 1, 1964, AND CARRYING CERTAIN DANGEROUS BULK CARGOES

32.63–1 Application—B/ALL. (a) The requirements of this subpart shall apply to all tank barges, the construction or conversion of which is started on or after July 1, 1964, and carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(4) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

32.63–5 Barge hull classifications—B/ALL. (a) Each barge subject to the provision of this subpart shall be assigned a hull type number. The Commandant will designate the barge hull types to be used for carrying cargoes in order to insure that the vessel is designed consistent with the degree and nature of the hazard of the commodity carried.

(b) For this purpose the barge hull types shall be as follows:

(1) Type I barge hull. Barge hulls classed as Type I are those designed to carry products which require the maximum preventive measures to preclude the uncontrolled release of the cargo to the waterways and/or atmosphere.

(2) Type II barge hull. Barge hulls classed as Type II are those designed to carry products which require substantial preventive measures to preclude uncontrolled release to the atmosphere, but whose uncontrolled release to the waterways does not constitute a longlasting public or operating personnel hazard, though local and temporary pollution may occur.

(3) Type III barge hull. Barge hulls classed as Type III are those designed to carry products of sufficient hazard to require a moderate degree of control.

32.63–8 Alternative arrangements—B/ALL. (a) Alternative arrangements, differing from those specifically required by this subpart, may be considered and approved by the Commandant, if it is demonstrated to his satisfaction that a degree of safety is obtained which is consistent with the intent of this subpart.

32.63–10 Rakes and coamings—B/ALL. (a) Each barge hull shall be constructed with a suitable bow form (length, shape, and height of headlog) to protect against diving at the maximum speed at which the barge is designed to be towed. In any integrated tow, only the lead barge need comply with this requirement. In any case, the operator of the towing vessel shall be guided by appropriate speed limitations.

(b) All open hopper type barge hulls shall be provided with coamings around the hopper space and, additionally, a 36-inch minimum height plowshare breakwater on the forward rake. Coamings shall have a minimum height of 36 inches forward graduated to a minimum height of 24 inches at midlength and 18 inches thereafter.

32.63–15 Subdivision and stability—B/ALL.

(a) General. In addition to complying with the requirements of Section 31.10–30 of this subchapter as applicable, Types I and II barge hulls shall comply with the applicable provisions of this section.

(b) Types I and II barge hulls. (1) Types I and II barge hulls shall be constructed with a complete watertight deck, or if of "open hopper type", of such construction that positive buoyancy and stability will be maintained when the barge is fully loaded and the hopper space is flooded to the height of the main deck. Credit may be given for the buoyancy, if any, of the immersed portion of the full cargo tanks when an effective arrangement for securing the tanks is provided.

(2)(i) Type I barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth, including the intersection of a transverse and a longitudinal watertight bulkhead.

(ii) Type I box barge hulls, specifically designed for operation in an integrated tow, shall retain positive buoyancy and stability after holing the bottom shell plating anywhere on its girth, except in way of a transverse watertight bulkhead, or after holing the side shell plating in way of a transverse watertight bulkhead.

(3) Type II barge hulls shall retain positive buoyancy and stability after holing the bottom or side shell plating anywhere on its girth except in way of a transverse watertight bulkhead.

32.63–20 Hull structure—B/ALL.

(a) General. In addition to complying with the requirements of Section 32.60–1, as applicable, barge hulls of Types I and II shall comply with the provisions of this section.

(b) Types I and II barge hull. Under an assumed grounding condition such that the forward rake bulkhead rests upon a pinnacle at the water surface, the maximum hull bending stress shall not exceed the following limits:

(1) Independent tanks may be installed in such a manner that they do not contribute to the strength and stiffness of the barge. In such case, the hull stress shall not exceed either 50 percent of the minimum ultimate tensile strength of the material or 70 percent of the yield strength when specified, whichever is greater.

(2) The Commandant may consider a reduction in hull stress when independent tanks are installed in such a manner as to contribute to the strength and stiffness of the barge and this is accounted for in determining the effective section modulus of the barge. In such case, the hull stress shall not exceed the percentage stress values prescribed in subparagraph (1) of this paragraph multiplied by the quantity $\left(1.5 - \frac{\text{SWT}}{\text{UTS}}\right)$, where SWT is the stress calculated without including the effect of the tanks, and UTS is the minimum ultimate tensile strength of the material. The value SWT, however, shall in no case be more than 75 percent of UTS.

32.63–25 Cargo tanks and supports—B/ALL.

(a) General. Saddles and hold-down securing straps for independent cargo tanks shall be designed to prevent tank failure due to loads induced in the saddles or straps by barge deflection.

(b) Collision protection. (1) All independent cargo tanks installed on Type I and Type II barge hulls shall be protected with suitable collision chocks or collision straps to withstand a longitudinal collision load of one and one-half times the weight of the tank and cargo. All other independent cargo tanks shall be provided with suitable collision chocks or collision straps to with-

stand a longitudinal collision load equal to the weight of the tank and cargo.

(2) All cargo tanks shall be so located as to reduce the likelihood of their being damaged in the event of collision. This protection shall be obtained by locating the cargo tanks not less than 4 feet from the side shell and box-end for Type I hulls and 3 feet for Type II barge hulls, and not less than 25 feet from the headlog at the bow for both types.

(c) Cargo tank design—(1) Types I and II barge hulls. (i) In addition to requirements provided for in applicable regulations for a specific commodity, cargoes subject to the provisions of this subpart shall be transported in cargo tanks meeting the requirements of this paragraph. Pressure vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined tank stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress in still water, and to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by Paragraph 32.63–20(b).

(ii) Gravity type cargo tanks shall have sufficient additional strength to limit the maximum combined tank stress, including saddle horn and bending stresses, to the yield strength of the tank material or 70 percent of the minimum ultimate tensile strength of the tank material, if less, in the grounded condition as required by Paragraph 32.63–20(b).

(2) Type III barge hulls. In addition to the requirements of this paragraph, pressure vessel-type cargo tanks shall have sufficient additional strength so as to limit the maximum combined stress, including saddle horn and bending stresses, to 1.5 times the maximum allowable hoop stress.

SUBPART 32.65—HULL REQUIREMENTS FOR TANK VESSELS CONSTRUCTED ON OR AFTER NOVEMBER 10, 1936, AND PRIOR TO JULY 1, 1951

32.65–1 Application — TB/ALL. The requirements in this subpart apply to all tank vessels, the construction or conversion of which was started on or after November 10, 1936, and prior to July 1, 1951.

32.65–5 Scantlings, material, and workmanship—TB/ALL. The hull and deckhouses shall be of steel or iron construction except that the pilothouse and decks over quarters may be constructed of wood. Scantlings, material, and workmanship, subdivision of cargo spaces, fitting of cofferdams, and testing of tanks shall be at least equivalent to the requirements of the American Bureau of Shipping or other recognized classification society.

32.65–10 Subdivision of cargo space—TB/ALL. The cargo space shall be divided into tight compartments as necessary to avoid excessive stresses and to provide stability.

32.65–15 Cofferdams—TB/ALL. Tank vessels equipped to carry Grade A, B, C, or D liquids shall have their galleys, living quarters, general cargo spaces, boilerrooms, and enclosed spaces containing propelling machinery or other machinery where sources of vapor ignition are normally present, segregated from their cargo tanks by cofferdams or equivalent pumprooms, tanks, or air spaces.

CROSS REFERENCE: *See* drawing No. 1 in the Appendix.

32.65–20 Pumprooms—TB/ALL. (a) Tank vessels handling Grade A, B, C, or D liquids shall have their cargo pumps isolated from all sources of vapor ignition by gastight bulkheads. Totally enclosed motors of the "explosion proof" type, motors ventilated on both the intake and exhaust by ducts to atmosphere, and engines driven by steam shall not be considered to be sources of vapor ignition. The gastight bulkhead between the pumproom and the pump-engine compartment may be pierced by fixed lights, drive shaft and pump-engine control rods, provided that the shafts and rods are fitted with stuffing boxes where they pass through the gastight bulkheads. The access to a cargo pumproom handling such liquids shall be from the open deck. (See Section 32.60–20.)

CROSS REFERENCE. *See* drawing No. 3 in the Appendix.

32.65–25 Living quarters—TB/ALL. Partitions and sheathing shall be of approved fire-resistive construction.

32.65–30 Tank vessels with independent tanks—TB/ALL. Independent cargo tanks may be located in hold spaces or in other cargo tanks but in all cases a working space of at least 15 inches shall be provided around such independent tanks, or else provisions shall be made for moving them to secure such space. When independent cargo tanks are located in an enclosed space other than a cargo tank, such enclosed space shall be considered as equivalent to a pumproom, and shall be safeguarded as such, as required in the regulations in this subchapter.

32.65–35 Tank vessels carrying Grade A liquids—TB/ALL. Cargo tanks for Grade A liquids having a Reid vapor pressure in excess of 25 pounds shall be independent of the hull.

32.65–40 Construction and testing of cargo tanks and bulkheads—TB/ALL. (a) All cargo tanks to be vented at gage pressures of 4 pounds per square inch or less shall be constructed and tested as required by the requirements of the American Bureau of Shipping or other recognized classification society.

(b) All cargo tanks to be vented at gage pressures above 4 pounds per square inch shall be considered as pressure vessels and shall meet the requirements for such vessels as to construction

and testing, as set forth in Subchapter F (Marine Engineering) of this chapter.

(c) Gastight bulkheads shall be subjected to a thorough hose test.

SUBPART 32.70—HULL REQUIREMENTS FOR STEEL HULL TANK VESSELS CONSTRUCTED PRIOR TO NOVEMBER 10, 1936

32.70-1 Application—TB/ALL. All steel hull tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall conform to the requirements in this subpart.

32.70-5 Hull requirements; general—TB/ALL. The scantlings, material, and workmanship, the subdivision of cargo spaces, the arrangement of cofferdams, the testing of tanks and cofferdams, shall be at least equivalent to the requirements of a recognized classification society for the particular service specified in the application for the certificate of inspection and permit for the transportation of liquid flammable cargoes in bulk as of the date when the tank vessel was built or as of the date when the vessel was converted into a tank vessel. In the absence of such classification requirements, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel's structure as specified in this section is safe for the service to be specified in its certificate of inspection.

32.70-10 Cofferdams—TB/ALL. Tank vessels carrying Grade A, B, or C liquids shall be required to conform to the construction requirements in regard to vertical cofferdams in Section 32.65-15, except that a dry cargo compartment shall be considered to be equivalent to a cofferdam, and except as provided for in Section 32.70-20.

CROSS REFERENCE: *See* drawing No. 1 in the Appendix.

32.70-15 Pumprooms—TB/ALL. Tank vessels handling Grade A, B, C or D liquid cargo shall meet the requirements for tank vessels in Section 32.65-20 except that the electrical installation shall comply with the requirements of Paragraph 32.45-10 (c).

CROSS REFERENCE: *See* drawing No. 4 in the Appendix.

32.70-20 Pump-engine compartment — TB/ALL. No cofferdam will be required between a cargo tank and a compartment containing pumping engines and their auxiliaries which are used exclusively during pumping operations, provided the pumping engine compartment contains no cargo valves and is well ventilated and provided further that internal combustion exhaust within the compartment are completely water jacketed or insulated and that gasoline engine intakes are fitted with effective flame arresters.

CROSS REFERENCE: *See* drawing No. 4 in the Appendix.

32.70-25 Cargo tanks—TB/ALL. Cargo tanks shall comply with the conditions specified in Sections 32.65-30 and 32.65-35, and shall pass the tests required in Section 32.65-40: *Provided, however*, That less than 15 inches around such tanks may be accepted if in the judgment of the Officer in Charge, Marine Inspection, making the inspection, a satisfactory inspection of the cargo tanks and hull structure can be made.

SUBPART 32.75—HULL REQUIREMENTS FOR WOOD HULL TANK VESSELS CONSTRUCTED PRIOR TO NOVEMBER 10, 1936

32.75-1 Application — TB/ALL. All wood hull tank vessels, the construction or conversion of which was started prior to November 10, 1936, shall conform to the requirements in this subpart.

32.75-5 Hull requirements; general—TB/ALL. The scantlings, material, and workmanship, and the fitting and fastening of parts shall be at least equivalent to the requirements of a recognized classification society for the particular service specified in the application for certificate of inspection and permit for the transportation of liquid flammable cargoes in bulk as of the date when the tank vessel was built, or as of the date when the vessel was converted into a tank vessel. In the absence of such classification requirements, the Officer in Charge, Marine Inspection, shall satisfy himself that the vessel's structure as specified in this section is safe for the service to be specified in its certificate of inspection.

32.75-10 Cargo tanks—TB/ALL. Cargo tanks shall be independent of the wood hull, shall be made of steel or iron, and shall pass the tests required in Paragraph 32.65-40 (a), (b). Where cargo tanks in wood hulls are not arranged to provide working space around them they shall be so constructed as to allow inspection of the hull, tanks, and bilges, and they shall be so installed that they can be moved to allow repairs to the hull structure and to themselves.

CROSS REFERENCE: *See* drawing No. 5 in the Appendix.

32.75-15 Electric bonding and grounding for tanks—TB/ALL. All independent cargo tanks in wood hull tank vessels shall be electrically bonded together with stranded copper cable of not less than No. 4 B and S gage and one end of this cable shall be grounded to a copper or brass plate of not less than 2 square feet in area and one-sixteenth inch in thickness and this plate shall be securely fastened to the hull, on the outside, at a point where it shall be covered by water when the tank vessel is unloaded.

32.75-20 Hold spaces and bulkheads—TB/ALL. In wood hull tank vessels containing independent cargo tanks for the transportation of Grade A, B, C, or D liquids, the hold spaces shall be considered as equivalent to a pumproom and shall be safeguarded and ventilated as such as required by Section 32.65-20. Where the hold spaces contain equipment or operations which are sources of vapor ignition, such equipment or operations shall be isolated from other spaces by

gastight bulkhead or, if it is impracticable to construct a gastight bulkhead, two structurally tight bulkheads without openings, separated by a well-ventilated air space 24 inches wide, where possible may be used.

CROSS REFERENCE: *See* drawing No. 5 in the Appendix.

SUBPART 32.80—TANK BARGES CONSTRUCTED OF MATERIALS OTHER THAN STEEL OR IRON

32.80-1 General requirements—B/ALL. All tank barges with hulls constructed of materials other than iron or steel, the construction or conversion of which was started prior to September 2, 1945, and to which certificates of inspection were issued prior to March 2, 1946, shall be considered the same as tank barges constructed prior to November 10, 1936.

SUBPART 32.85—LAMP AND PAINTROOMS AND SIMILAR COMPARTMENTS ON TANKSHIPS

32.85-1 Fireproofing of lamp, oil and paintrooms—T/ALL. (a) Lamp, oil and paintrooms shall be wholly and tightly lined with metal.

PART 33—LIFESAVING APPLIANCES

SUBPART 33.01—GENERAL LIFESAVING REQUIREMENTS

Sec.

33.01-1 Inspection of lifesaving appliances—TB/ALL.
33.01-5 Construction of lifesaving equipment—TB/ALL.
33.01-15 Responsibility of master regarding lifesaving equipment—TB/ALL.
33.01-20 Approval for repairs and alterations—TB/ALL.
33.01-25 Factory inspection of lifesaving equipment—TB/ALL.
33.01-27 Weight test of lifeboat installation—T/ALL.
33.01-30 Approval of lifesaving appliances—TB/ALL.
33.01-35 Magazine chests for pyrotechnic equipment—T/ALL.

SUBPART 33.05—LIFEBOATS, LIFERAFTS, AND BUOYANT APPARATUS REQUIRED

33.05-1 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started prior to November 19, 1952—T/OC.
33.05-2 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started on or after November 19, 1952, and prior to May 26, 1965—T/OC.
33.05-3 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which started on or after May 26, 1965—T/OC.
33.05-5 Lifeboats for barges; ocean—B/O.
33.05-15 Lifeboats for barges; coastwise—B/C.
33.05-20 Lifeboats and liferafts for tank vessels; Great Lakes—TB/L.
33.05-25 Lifeboats, liferafts, or buoyant apparatus for tank vessels; bays, sounds, lakes other than Great Lakes, and rivers—TB/BR.
33.05-30 Equipment for tank vessels on short voyages beyond certificated waters—TB/LB.
33.05-35 Wooden lifeboats prohibited on tank vessels—TB/ALL.

SUBPART 33.07—SUBSTITUTION OF INFLATABLE LIFERAFTS FOR LIFEBOATS, OTHER LIFERAFTS, LIFEFLOATS, AND BUOYANT APPARATUS ON CERTAIN VESSELS NOT ON AN INTERNATIONAL VOYAGE

33.07-1 Inflatable liferafts on barges—B/ALL.
33.07-5 Inflatable liferafts for other liferafts, lifefloats, and buoyant apparatus—T/ALL.
33.07-10 Inflatable liferafts for lifeboats on tankships under 500 gross tons—T/ALL.
33.07-15 Inflatable liferafts for lifeboats on certain tankships of 500 to 1,600 gross tons—T/ALL.
33.07-20 Inflatable liferafts for lifeboats on certain tankships of 1,600 to 3,000 gross tons—T/ALL.
33.07-25 Inflatable liferafts for lifeboats on certain tankships of 3,000 gross tons and upward—T/ALL.

SUBPART 33.10—LIFEBOAT HANDLING EQUIPMENT REQUIREMENTS

33.10-1 Lifeboat davits—TB/ALL.
33.10-5 Lifeboat winches—TB/ALL.
33.10-10 Blocks and falls for lifeboats—TB/ALL.
33.10-15 Disengaging apparatus—T/OCL.
33.10-20 Disengaging apparatus—T/BR and B/ALL.

SUBPART 33.15—EQUIPMENT FOR LIFEBOATS, LIFERAFTS, OR BUOYANT APPARATUS

Sec.

33.15-1 Lifeboat, liferaft or buoyant apparatus equipment; general—TB/ALL.
33.15-5 Required equipment for lifeboats—TB/ALL.
33.15-10 Description of equipment for lifeboats—TB/ALL.
33.15-15 Required equipment for rigid type liferafts and buoyant apparatus—TB/LBR.
33.15-16 Required equipment for inflatable liferafts—TB/ALL.
33.15-20 Description of equipment for liferafts and buoyant apparatus—TB/LBR.
33.15-25 Portable radiotelegraph apparatus—T/OC.
33.15-90 Lifeboat, liferaft and buoyant apparatus equipment on tank vessels contracted for prior to May 26, 1965—TB/ALL.

SUBPART 33.20—STOWAGE OF LIFEBOATS, LIFERAFTS, AND BUOYANT APPARATUS

33.20-1 Davits and launching devices—TB/ALL.
33.20-3 Embarkation aids into inflatable liferafts—T/ALL.
33.20-5 Lifeboat davit falls—T/ALL.
33.20-10 Lifeboats and liferafts kept clear for launching—TB/ALL.
33.20-15 Stowage of lifeboats and liferafts—TB/ALL.
33.20-20 Hydraulic releases—TB/ALL.

SUBPART 33.25—MARKINGS, CARE, AND INSPECTION

33.25-5 Numbering and marking of lifeboats—TB/ALL.
33.25-10 Marking of liferafts—TB/ALL.
33.25-15 Overhaul—TB/ALL.
33.25-20 Maintenance—TB/ALL.

SUBPART 33.30—MANNING OF LIFEBOATS AND LIFERAFTS

33.30-1 Persons in charge of each lifeboat and liferaft—T/O.
33.30-3 Person in charge of each lifeboat or liferaft—T/CLB.
33.30-5 Manning of lifeboats and liferafts—TB/OCLB.
33.30-10 Motor-propelled lifeboat—TB/ALL.
33.30-15 Lifeboat carrying a radio-telegraph and/or searchlight—TB/ALL.

SUBPART 33.35—LIFE PRESERVERS

33.35-1 Number and type required—TB/ALL.
33.35-5 Distribution and stowage—TB/ALL.
33.35-10 Shipboard inspections—TB/ALL.
33.35-15 Requirements for life preservers—TB/ALL.

SUBPART 33.40—RING LIFE BUOYS AND WATER LIGHTS

33.40-1 Ring life buoys and water lights, general requirements—TB/ALL.
33.40-5 Number required on tankships—T/ALL.
33.40-10 Number required on tank barges—B/ALL.
33.40-15 Distribution and security—TB/ALL.

SUBPART 33.45—DISTRESS SIGNALS

33.45-1 Distress signals—T/ALL and B/OC.
33.45-5 Parachute distress signals—T/OC.
33.45-10 Stowage of distress signals—TB/ALL.

SUBPART 33.50—SIGNALING LAMP

Sec.

33.50-1 Signaling lamp—T/O.

SUBPART 33.55—LINE-THROWING APPLIANCES

33.55-1 Line-throwing appliances required—T/OC.
33.55-5 Accessibility—T/OC.
33.55-10 Equipment for line-throwing appliances—T/OC.
33.55-15 Service recommendations—T/OC.

AUTHORITY: The provisions of this Part 33 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Additional authority is cited in parentheses following the sections affected.

SUBPART 33.01—GENERAL LIFESAVING REQUIREMENTS

33.01-1 Inspection of lifesaving appliances—TB/ALL. At each inspection for certification and at any other time as required by the Officer in Charge, Marine Inspection, all lifesaving appliances on a tank vessel shall be inspected.

33.01-5 Construction of lifesaving equipment—TB/ALL. All tank vessels subject to the regulations in this subchapter shall have lifeboats, disengaging apparatus, liferafts, life preservers, and all other lifesaving apparatus constructed in accordance with the regulations contained in the applicable subparts of Subchapter Q (Specifications) of this chapter: *Provided, however*, That all lifesaving apparatus which is of the character that complied with the rules and regulations of the Commandant, on vessels in existence at the time that the regulations in this subchapter are promulgated and have been in use on such vessels, may be continued in use so long as such existing lifesaving equipment and apparatus are found to be in good and workable condition. Where lifesaving equipment and apparatus are not found to be in good and workable condition, they shall be repaired or else replaced by lifesaving equipment and apparatus of the latest approved type, as required by the regulations in this subchapter and Subchapter Q (Specifications) of this chapter. Where lifesaving equipment and apparatus are found to be in good and workable condition but deficient as to quantity or numbers, the additional quantity or numbers required by the regulations in this subchapter shall be of the latest approved type.

33.01-15 Responsibility of master regarding lifesaving equipment—TB/ALL. It shall be the duty of the master or person in charge to see that the lifeboats, liferafts, davits, falls, life preservers, and other lifesaving appliances are at all times ready for use, and that all equipment for his vessel required by the regulations in this subchapter are provided, maintained, and replaced as indicated.

33.01-20 Approval for repairs and alterations—TB/ALL. No extensive repairs or alterations, except in emergency, shall be made to any lifeboat, lifeboat disengaging apparatus, life preserver, liferaft, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs and alterations shall so far as is practicable be made with materials and tested in the manner specified in this subchapter and applicable requirements in Subchapter Q (Specifications) of this chapter for new construction. Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, where the vessel may call after such repairs are made; nor shall any lifeboat or liferaft be reconditioned or used on a tank vessel other than that for which it was built, without notice to and supervision by the Officer in Charge, Marine Inspection, where such reconditioning or repairs are to be made.

33.01-25 Factory inspection of lifesaving equipment—TB/ALL. The Coast Guard District Commander where lifesaving apparatus is built shall detail an inspector to any place where lifeboats, liferafts, or buoyant apparatus are being built, who will inspect and examine carefully their construction and he shall satisfy himself that such lifeboats, liferafts, or buoyant apparatus are constructed in accordance with the drawings, or blueprints, and specifications furnished by the builders to the Coast Guard. When the inspector approves the construction of the lifeboat, liferaft, or buoyant apparatus, he will stamp his initials, together with the letters "U. S. C. G." on a blank space on the plate required to be affixed to the unit by the builder. The initials of the inspector shall be satisfactory evidence to all parties interested that the unit has been constructed in accordance with the drawings, or blueprints, and specifications on file with the Coast Guard.

33.01-27 Weight test of lifeboat installation—T/ALL. (a) The following test shall be made at least once in each two-year period. If practicable, it shall be made at the inspection for certification or at a reinspection.

(b) Each lifeboat shall be lowered to near the water and then be loaded with its allowed capacity, evenly distributed throughout the length, and then be lowered into the water until it is afloat, and be released from the falls. In making this test, persons or dead weight may be used. The total weight used shall be at least equal to the allowed capacity of the lifeboat considering persons to weigh 165 pounds each.

33.01-30 Approval of lifesaving appliances—TB/ALL. (a) Any type of lifeboat or liferaft approved by the Commandant shall be considered as equivalent to the standard lifeboat or liferaft.

(b) Lifeboats shall be of an approved type and constructed in accordance with Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(c) A Class 1 motor lifeboat is one that is fitted

with a compression-ignition engine, is capable of being readily started in all conditions, and has sufficient fuel for 24 hours continuous operation. The speed ahead in smooth water when loaded with its full complement of persons and equipment shall be at least 6 knots.

(d) Rigid type liferafts shall be of an approved type and constructed in accordance with Subpart 160.018 of Subchapter Q (Specifications) of this chapter.

(e) Buoyant apparatus shall be of an approved type and constructed in accordance with Subpart 160.010 of Subchapter Q (Specifications) of this chapter.

(f) Inflatable liferafts shall be of an approved type constructed in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter. On tankships on an international voyage, each inflatable liferaft shall have a carrying capacity of not less than 6 nor more than 25 persons.

(g) In general, a suitable rescue boat shall be a small lightweight boat of rigid construction, with built-in buoyancy and capable of being readily launched and easily maneuvered. Also it shall be of adequate proportion to permit taking an unconscious person on board without capsizing. A rescue boat and its installation shall be acceptable to the Officer in Charge, Marine Inspection, as suitable for the rescue of persons accidentally falling over the side or for similar emergency purposes. The size, shape, installation, and other factors of suitability will be determined with due consideration of the size, arrangement, intended service, and crew requirements of the vessel on which it is to be installed. For protected waters, a rescue boat, constructed in accordance with Subpart 160.056 of Subchapter Q (Specifications) of this chapter, is acceptable in meeting the intent of this paragraph. For exposed waters, a more seaworthy rescue boat may be required, but in no case shall more than one approved lifeboat suitable for rescue work be required.

(R.S. 4491, as amended; 46 U.S.C. 489)

33.01–35 Magazine chests for pyrotechnic equipment—T/ALL. Tankships required to carry pyrotechnic distress signals or line-throwing appliances shall be provided with a portable magazine chest. (See Subpart 160.038, portable magazine chests, of Subchapter Q (Specifications) of this chapter.) Magazine chests shall be secured above the freeboard deck away from heat. Stowage in enclosed spaces or adjacent to cargo tanks is prohibited.

SUBPART 33.05—LIFEBOATS, LIFERAFTS, AND BUOYANT APPARATUS REQUIRED

33.05–1 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started prior to November 19, 1952—T/OC. (a) All tankships 500 gross tons and over shall carry a sufficient number of lifeboats on each side to accommodate all persons on board: *Provided*, That such tankships of 350 feet in length or over, having superstructure amidships and propelling machinery aft shall be provided with at least four lifeboats, one on each side in way of the after accommodations, and one on each side in way of amidship accommodations.

(b) All tankships of less than 500 gross tons shall be provided with sufficient lifeboats to accommodate all persons on board.

(c) No lifeboat shall be of less than 180 cubic feet measurement, except, in the case of coastwise vessels, if specifically approved by the Commandant.

(d) All tankships of 1,600 gross tons and over on an international voyage shall carry at least one Class 1 motor lifeboat on each side. The requirement of this paragraph shall not apply except for replacements, and then only if it can be done without change to existing davits, winches, and arrangements.

(e) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07 of this part.

(f) All tankships in ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

33.05–2 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which was started on or after November 19, 1952 and prior to May 26, 1965—T/OC. (a) All tankships 500 gross tons and over shall carry a sufficient number of lifeboats on each side to accommodate all persons on board: *Provided*, That such tankships of 3,000 gross tons and over, having a superstructure amidships and propelling machinery aft shall be provided with at least four lifeboats, one on each side in way of the after accommodations, and one on each side in way of amidship accommodations.

(b) All tankships of less than 500 gross tons shall be provided with sufficient lifeboats to accommodate all persons on board.

(c) No lifeboat shall be less than 24 feet in length, except where owing to the size of the tankship, or for other reasons, the Commandant may permit smaller lifeboats, but in no case shall they be less than 16 feet in length.

(d) All tankships of 1,600 gross tons and over on an international voyage shall carry at least one Class 1 motor lifeboat on each side. The requirement of this paragraph shall not apply

except for replacements, and then only if it can be done without change to existing davits, winches, and arrangements.

(e) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07 of this part.

(f) All tankships in ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

33.05-3 Lifeboats and liferafts for tankships; ocean and coastwise; construction or conversion of which started on or after May 26, 1965—T/OC. (a) All ocean and coastwise tankships 500 gross tons and over shall carry a sufficient number of lifeboats on each side to accommodate all persons on board.

(b) All tankships of less than 500 gross tons shall be provided with sufficient lifeboats to accommodate all persons on board.

(c) All tankships of 3,000 gross tons and over on an international voyage shall carry not less than four lifeboats. Two lifeboats shall be carried aft and two amidships except that in tankships which have no amidships superstructure all lifeboats shall be carried aft: *Provided*, That, if in the case of tankships with no amidships superstructure it is impracticable to carry four lifeboats aft, the Commandant may permit instead the carriage aft of one lifeboat on each side of the ship. In such cases:

(1) Each lifeboat shall not exceed 26 feet in length;

(2) Each lifeboat shall be stowed as far forward as practicable, but at least so far forward that the after end of the lifeboat is 1½ times the length of the lifeboat forward of the propeller; and

(3) Each lifeboat shall be stowed as near the sea level as is safe and practicable.

(d) No lifeboat shall be less than 24 feet in length, except where owing to the size of the tankship, or for other reasons, the Commandant may permit smaller lifeboats, but in no case shall they be less than 16 feet in length.

(e) All tankships 1,600 gross tons and over on an international voyage shall carry on each side at least one Class 1 motor lifeboat.

(f) All tankships certificated for ocean service, and all tankships of less than 1,600 gross tons on an international voyage shall carry inflatable liferafts of sufficient capacity to accommodate at least 50 percent of the persons on board. Those tankships having widely separated accommodation and/or working spaces shall have at least one liferaft in each such location.

(g) Inflatable liferafts may be substituted for lifeboats on certain vessels not on an international voyage in accordance with Subpart 33.07 of this part.

33.05-5 Lifeboats for barges; ocean—B/O. (a) All tank barges which normally operate more than 20 miles offshore shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat shall be of less than 125 cubic feet measurement.

(c) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with Subpart 33.07.

33.05-15 Lifeboats for barges; coastwise—B/C. (a) All tank barges which normally operate 20 miles or less offshore shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat on a tank barge of 100 gross tons or over shall be of less than 125 cubic feet measurement, except by approval of the Commandant. No lifeboat on a tank barge of less than 100 gross tons shall be of less than 90 cubic feet measurement, except by approval of the Commandant.

(c) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with Subpart 33.07.

33.05-20 Lifeboats and liferafts for tank vessels; Great Lakes—TB/L. (a) All tank vessels operating on the waters of the Great Lakes shall carry a sufficient number of lifeboats to accommodate all persons on board.

(b) No lifeboat on a tank vessel of 100 gross tons or over shall be of less than 90 cubic feet measurement, except by approval of the Commandant. No lifeboat on a tank vessel of less than 100 gross tons shall be of less than 60 cubic feet measurement.

(c) All tankships of 300 gross tons and over in Great Lakes service shall carry, in addition to the lifeboats required by paragraph (a) of this section, approved inflatable liferafts of such aggregate capacity to accommodate all persons on board: *Provided*, That such tankships, which are equipped with lifeboats in accordance with Section 33.05-1, shall carry additional approved inflatable liferafts for not less than 50 percent of the persons carried. Any such tankship, when it has crew, berthing and/or working spaces which are widely separated, shall have at least two approved inflatable liferafts. The capacity and location shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) Inflatable liferafts may be substituted for lifeboats on certain vessels in accordance with Subpart 33.07.

33.05-25 Lifeboats, liferafts, or buoyant apparatus for tank vessels; bays, sounds, lakes other than Great Lakes, and rivers—TB/BR. (a) All tank vessels, except those on an international voyage, operating exclusively on bays,

sounds, lakes (other than the Great Lakes), rivers, harbors, or inland waters tributary to the Gulf of Mexico, shall carry lifeboats, liferafts, or buoyant apparatus of sufficient number to accommodate all persons on board.

(b) No lifeboat shall be of less than 60 cubic feet measurement.

(c) The minimum size of any piece of buoyant apparatus shall be such as to accommodate at least five persons.

(d) Inflatable liferafts may be substituted for lifeboats, liferafts and buoyant apparatus on certain vessels in accordance with Subpart 33.07.

(e) All tankships on an international voyage shall meet the applicable requirements of Sections 33.05–1 through 33.05–3.

33.05–30 Equipment for tank vessels on short voyages beyond certificated waters—TB/LB. (a) The Officer in Charge, Marine Inspection, may issue permits to tank vessels of less than 100 gross tons which are certificated for lake, bay, and sound routes, to engage on short voyages to points beyond such waters, but not more than 15 miles from port of refuge: *Provided*, That such vessels are equipped with a sufficient number of lifeboats, liferafts, or buoyant apparatus to accommodate all persons on board.

(b) No lifeboat shall be of less than 60 cubic feet measurement. The minimum size of any liferaft or piece of buoyant apparatus shall be such as to accommodate at least five persons.

(c) Inflatable liferafts may be substituted for lifeboats, liferafts and buoyant apparatus on certain vessels in accordance with Subpart 33.07.

33.05–35 Wooden lifeboats prohibited on tank vessels—TB/ALL. Lifeboats installed on tank vessels after September 1, 1943, shall be constructed of metal or other material approved by the Commandant. Internals, such as buoyancy tanks, water tanks, and provision and equipment lockers may be constructed of suitable materials other than metal which have been approved by the Commandant.

SUBPART 33.07—SUBSTITUTION OF INFLATABLE LIFERAFTS FOR LIFEBOATS, OTHER LIFERAFTS, LIFEFLOATS, AND BUOYANT APPARATUS ON CERTAIN VESSELS NOT ON AN INTERNATIONAL VOYAGE

33.07–1 Inflatable liferafts on barges—B/ALL. (a) On all tank barges inflatable liferafts may be substituted for lifeboats, other types of liferafts, lifefloats, and buoyant apparatus wherever they may be required.

(b) The capacity of inflatable rafts carried in place of other liferafts, lifefloats, and buoyant apparatus shall be sufficient to accommodate all persons on board.

(c) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

33.07–5 Inflatable liferafts for other liferafts, lifefloats and buoyant apparatus—T/ALL. (a) On all tankships inflatable liferafts may be permitted as substitutes for other types of liferafts, lifefloats, and buoyant apparatus required by this part.

(b) The capacity of inflatable liferafts carried in place of other type liferafts, lifefloats, and buoyant apparatus shall be at least equivalent to that required of equipment for which substitution is made. This requirement is in addition to the inflatable liferafts required by Subpart 33.05 of this part.

(c) The substitution of inflatable liferafts shall not be made without prior approval of the Officer in Charge, Marine Inspection.

33.07–10 Inflatable liferafts for lifeboats on tankships under 500 gross tons—T/ALL. (a) On all tankships under 500 gross tons, inflatable liferafts may be substituted for all required lifeboats.

(b) The total capacity of the inflatable liferafts shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate. In the case of total substitution of inflatable liferafts for lifeboats, at least two inflatable liferafts shall be carried. Partial substitution is permissible provided the aggregate lifeboat and inflatable liferaft capacity is sufficient to accommodate the required number of persons carried.

(c) Where substitution of inflatable liferafts is made, a suitable rescue boat shall be provided. In the case of partial substitution, a lifeboat may serve as the rescue boat.

(d) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

33.07–15 Inflatable liferafts for lifeboats on certain tankships of 500 to 1,600 gross tons—T/ALL. (a) On all tankships of 500 gross tons and upwards to 1,600 gross tons inflatable liferafts may be substituted for all required lifeboats provided one approved lifeboat of a size acceptable to the Officer in Charge, Marine Inspection, suitable for rescue purposes, is installed.

(b) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats would have been required to accommodate.

(c) The launching arrangement and location of the lifeboat to be used as rescue boat shall be such that it can be readily launched and shall be to the satisfaction of the Officer in Charge, Marine Inspection.

(d) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

33.07–20 Inflatable liferafts for lifeboats on certain tankships of 1,600 to 3,000 gross tons—T/ALL. (a) On all tankships of 1,600

gross tons and upwards to 3,000 gross tons inflatable liferafts may be substituted for all except two of the required lifeboats. These lifeboats shall be of a size acceptable to the Officer in Charge, Marine Inspection, and shall be suitable for rescue purposes. In all cases, two approved lifeboats, one on each side, shall be provided.

(b) The aggregate lifeboat and inflatable liferaft capacity shall be at least equal to the total number of persons that the lifeboats, for which substitutions are made plus those remaining on board, would have been required to accommodate.

(c) The substitution of inflatable liferafts for lifeboats shall not be made without prior approval of the Officer in Charge, Marine Inspection.

33.07-25 Inflatable liferafts for lifeboats on certain tankships of 3,000 gross tons and upward—T/ALL. (a) The Commandant may give special consideration to the substitution of approved inflatable liferafts for required lifeboats on tankships of 3,000 gross tons and over.

SUBPART 33.10—LIFEBOAT HANDLING EQUIPMENT REQUIREMENTS

33.10-1 Lifeboat davits—TB/ALL. (a) No type or make of mechanical or gravity davit shall be used unless it has first been approved by the Commandant. For construction of davits see Subpart 160.032 of Subchapter Q (Specifications) of this chapter.

(b) On any tank vessel the keel of which was laid after September 1, 1941, davits for lifeboats weighing in excess of 5,000 pounds when fully equipped (but without persons) shall be of the gravity type.

(c) On tank vessels of 1,600 gross tons and over on an international voyage, contracted for on or after May 26, 1965, all davits shall be of the gravity type.

(d) No davit arm or frame comprising mechanical or gravity davits shall be placed on board any vessel until all the requirements of this section and Subpart 160.032 of Subchapter Q (Specifications) of this chapter have been met.

(e) Whenever mechanical or gravity davits or parts of davits, such as davit arms, or frames, are installed on vessels, to take the place of davits, davit arms, or frames which have been damaged or broken, such davits or frames shall have the manufacturer's nameplate affixed thereto.

33.10-5 Lifeboat winches—TB/ALL. (a) When lifeboat winches are installed on tank vessels, wire falls shall be provided for each set of davits.

(b) On tankships of 500 gross tons and over in ocean or coastwise service, construction or conversion of which is started on or after November 19, 1952, lifeboat winches shall be provided for all lifeboats, where the deck on which the lifeboats are carried exceeds 20 feet from the lightest seagoing draft.

(c) Lifeboat winches proposed for use in new installations shall be of an approved type and constructed in accordance with Subpart 160.015 of Subchapter Q (Specifications) of this chapter.

(d) Suitable fabric covers shall be provided, so fitted over exposed mechanisms that ice formations may be readily broken adrift when necessary to operate the lifeboat winch.

(e) Installation: Lifeboat winches shall be so located that the operator can observe the movement of the lifeboat during the lowering operation. The lead of the falls to the lifeboat winch shall be in accordance with Paragraph 33.10-10 (g).

(f) Tests: Upon completion of the installation of all lifeboat winches, and before the vessel is certificated for service, the following tests and examinations shall be made in the presence of an inspector:

(1) Swing lifeboat out from chocks and lower to level for loading, at which point the lifeboat shall be loaded with dead weight equivalent to the number of persons allowed (165 pounds per person) together with weight of equipment, plus 10 percent of the total load. The lifeboat should then be lowered to the water, stopping at approximately 6-foot intervals by action of the counterweight alone. During the test the following observations should be made:

(i) Brake action shall be smooth, but positive. Brakes exposed to the weather shall also be tested under the load lowering condition with the braking surface wetted.

(ii) Counterweight shall be capable of stopping and holding the lifeboat when released.

(iii) The lifeboat winch shall be capable of controlling the speed of lowering of the fully equipped lifeboat with its complement of persons on board to not more than 120 feet per minute. In addition, the speed of lowering of the fully equipped lifeboat without its complement of persons shall be not less than 40 feet per minute.

(iv) No part of lowering gear shall show any distress under load.

(v) Deck under lifeboat winch and davits must be of sufficient strength to prevent any undue stress of the deck under load.

(vi) Mechanical davits shall swing to extreme outboard position without slacking the lifeboat winch brake.

(vii) Action of governor brake and lowering speed permitted by same should be noted.

(viii) Determine that falls are of sufficient length to lower to light load line with vessel listed 15 degrees either way.

(2) A report of the results of the installation test covering all the above points shall be recorded.

33.10-10 Blocks and falls for lifeboats—TB/ALL. Blocks and falls installed after May 1,

1942, shall conform to the following requirements:

(a) All blocks, falls, fairleads, padeyes, fastenings, etc., used in connection with lifeboat gear shall be designed with a minimum factor of safety of six, based on the maximum working load.

(b) Where lifeboat winches are installed, not more than two-part wire falls shall be used, except in specific cases where three-part wire falls may be accepted. Where lifeboat winches are not used, the falls shall be of manila rope or equivalent but wire rope may not be used.

(c) Wire rope falls of 6 x 19 regular lay filler wire construction prelubricated at the factory with suitable neutral wire rope lubricant shall be accepted as standard. Any other type of wire superior or equally as good as the minimum standard specified may be used.

(d) Falls shall be of such length that the lifeboat may be lowered to the water with the vessel at the lightest seagoing draft, listed 15 degrees either way.

(e) All ocean and coastwise vessels and all other vessels of over 1,000 gross tons, not fitted with lifeboat winches, shall be provided with covered tubs, boxes, or reels for stowage of falls and with suitable lowering bitts in easily accessible positions; except that all ocean and coastwise, self-propelled vessels of over 1,000 gross tons, not fitted with lifeboat winches for which contracts for construction are let on or after September 2, 1945, shall be fitted with cruciform bitts in such position as will render lowering practicable.

(f) Where more than one lifeboat is served by the same set of davits, if the falls are of manila rope, separate falls shall be provided to serve each lifeboat.

(g) Such blocks as are necessary to allow the falls to lead fair in all positions of the davit shall be fitted. Sheaves for wire rope shall have a diameter at the base of the groove at least equal to 12 times the diameter of the rope.

(h) There shall be ample clearance between the cheeks of blocks in which manila rope is used. The width between the cheeks shall be half an inch greater than the diameter of new ropes when those ropes are 3¾ inches in circumference or greater; blocks for smaller ropes shall be designed with clearance in the same proportion.

(i) Means for lubrication shall be provided for all moving parts of blocks.

(j) Where lifeboat winches are provided on tank vessels, construction or conversion of which was started prior to November 19, 1952, there shall be at least 8 feet between the center of the drum and the center of the nearest sheave.

(k) Where lifeboat winches are provided on tank vessels, construction or conversion of which is started on or after November 19, 1952, the lead sheaves to the drums shall be so located as to provide fleet angles of not more than 8 degrees for grooved drums and not more than 4 degrees for nongrooved drums. By fleet angle is meant the angle included between an imaginary line from the lead sheave perpendicular to the axis of the drum and the line formed by the wire rope when led from the lead sheave to either extremity of the drum.

33.10–15 Disengaging apparatus—T/OCL.

(a) Type required. (1) Lifeboats on all ocean, coastwise and Great Lakes tankships of over 3,000 gross tons, the construction or conversion of which is started on or after January 1, 1961, shall be fitted with mechanical disengaging apparatus of an approved type constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter. Such disengaging apparatus shall be so arranged as to make it possible for the lifeboats to be launched while such vessels are under way or stopped, and for both ends of the lifeboat to be released simultaneously, under tension, by one person. The gears shall be capable of being released from one position in the lifeboat while the boat is fully loaded with allowed persons and equipment. Simultaneous release shall be effected by partially rotating a shaft which shall be continuous and extend from one point of contact with the hooks.

(2) Lifeboats on all ocean, coastwise and Great Lakes tankships of not over 3,000 gross tons shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus, if fitted, shall be of approved type constructed in accordance with Subpart 160.033 of Subchapter Q (Specifications) of this chapter.

(3) Lifeboats on all ocean, coastwise and Great Lakes tankships of over 3,000 gross tons, the construction or conversion of which is started before January 1, 1961, shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus, if fitted, shall be as follows:

(i) On all such tankships mechanical disengaging apparatus shall be of a type approved by the Commandant.

(ii) On all such ocean and coastwise tankships, the construction or conversion of which was started on or after July 1, 1961, the arrangement shall be as described in subparagraph (1) of this paragraph.

(b) Replacement of lifeboats on vessels of over 3,000 gross tons. (1) Replacement of lifeboats on ocean, coastwise and Great Lakes tankships of over 3,000 gross tons shall be in accordance with the following:

(i) All replacement lifeboats shall be fitted with approved mechanical disengaging apparatus constructed and arranged as described in paragraph (a) (1) of this section.

(2) Replacement of lifeboats in accordance with the provisions of this paragraph may be made on an individual lifeboat basis.

33.10-20 Disengaging apparatus — T/BR and B/ALL. (a) Lifeboats shall be fitted with suitable disengaging apparatus. Mechanical disengaging apparatus shall be of a type approved by the Commandant.

(b) Not more than one type of releasing gear shall be fitted in the lifeboats of a particular vessel unless otherwise approved by the Commandant.

SUBPART 33.15—EQUIPMENT FOR LIFEBOATS, LIFERAFTS, OR BUOYANT APPARATUS

33.15-1 Lifeboat, liferaft or buoyant apparatus equipment; general—TB/ALL. (a) The provisions of this subpart with the exception of Section 33.15-90 shall apply to all vessels contracted for on or after May 26, 1965. Vessels contracted for prior to May 26, 1965 shall meet the requirements of Section 33.15-90.

(b) Equipment for lifeboats, liferafts, and buoyant apparatus shall be of good quality, efficient for the purpose they are intended to serve, and kept in good condition.

(c) Lifeboats, liferafts and buoyant apparatus shall be fully equipped before the vessel is navigated and the equipment shall remain in such lifesaving appliances throughout the voyage except as provided by Section 33.25-15.

(d) It shall be unlawful to stow in any lifeboat, liferaft, or buoyant apparatus any article not required by this subpart unless such articles can be properly stowed so as not to reduce the seating capacity or space available to the occupants and so as not to adversely affect the seaworthiness of such appliances or, in the case of lifeboats, overload the davits or winches.

(e) Loose equipment, except boathooks in lifeboats, shall be securely attached to the lifesaving appliance to which it belongs.

33.15-5 Required equipment for lifeboats—TB ALL. (a) The lifeboats for all tank vessels shall be equipped in accordance with Table 33.15-5 (a). For a description of the items contained in this table, and the units comprising the items, see the applicable paragraphs of Section 33.15-10. The letter identification prefixing the item in the table corresponds to the paragraph designations in Section 33.15-10.

Table 33.15-5(a)

Letter identification	Item	Tankship			Tank barge—all waters
		Ocean and coastwise	Great Lakes	Lakes, bays, sounds, and rivers	
a	Bailer	1	1	None	None
b	Bilge pump	1	None	None	None
c	Boathooks	2	1	1	[1] [2]
d	Bucket	2	1	1	1
e	Compass and mounting	1	None	None	None
f	Ditty bag	1	None	None	None
g	Drinking cup	1	None	None	[2] 1
h	Fire extinguisher (motor-propelled lifeboats only).	2	2	2	2
i	First-aid kit	1	None	None	None
j	Flashlight	1	1	None	None
k	Hatchet	2	2	1	None
l	Heaving line	2	None	None	None
m	Jackknife	1	None	None	[2] 1
n	Ladder, lifeboat, gunwale	1	None	None	None
o	Lantern	1	1	1	1
p	Lifeline	1	1	1	1
q	Life preservers	2	2	2	2
r	Locker	1	1	None	None
s	Mast and sail (oar-propelled lifeboats only).	1	None	None	None
t	Matches (boxes)	2	1	1	[1] [2]
u	Milk, condensed (pounds per person).	1	None	None	None
v	Mirror, signaling	2	None	None	None
w	Oars (units)	[3] 1	[3] 1	[3] 1	[3] 1
x	Oil, illuminating (quarts)	1	1	None	None
y	Oil, storm (gallons)	1	1	None	None
z	Painter	2	2	1	1
aa	Plug	1	1	1	1
bb	Provisions (pounds per person)	2	None	None	None
cc	Rowlocks (units)	[3] 1	[3] 1	[3] 1	[3] [4] 1
dd	Rudder and tiller	1	1	None	[2] 1
ee	Sea anchor	1	1	None	None
ff	Signals, distress, floating orange smoke.	2	None	None	None
gg	Signals, distress, red hand flare (units).	[3] 1	[3] ½ unit	None	None
hh	Signals, distress, red parachute flare (units).	[3] [5] 1	[3] ½ unit	None	None
ii	Tool kit (motor-propelled lifeboats only).	[3] 1	[3] 1	[3] 1	[3] 1
jj	Water (quarts per person)	3	None	None	[2] 1
kk	Whistle, signaling	1	None	None	None
ll	Fishing kit	1	None	None	None
mm	Cover, protecting	1	None	None	None
nn	Signals, lifesaving	1	None	None	None
oo	Desalting kit	[6] 1	None	None	None

[1] Only 1 required on other than seagoing barges.
[2] Seagoing barges only.
[3] For description of unit see § 33.15-10.
[4] Lifeboats on barges need only carry 4 rowlocks.
[5] Vessels in coastwise service need only carry 1 unit for each 5 lifeboats or fraction thereof.
[6] Optional equipment. See § 33.15-10(jj), water.

33.15-10 Description of equipment for lifeboats—TB/ALL—(a) Bailer. The bailer shall have a lanyard attached and shall be of sufficient size and suitable for bailing.

(b) Bilge pump. Bilge pumps shall be of an approved type, constructed in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter. They shall be of the size given in Table 33.15-10 (b) depending upon the capacity of the lifeboat as determined by the six-tenths rule as described in Paragraph 160.035-9(b).

(c) Boathooks. Boathooks shall be of the single hook ballpoint type. Boathook handles shall be of clear grained white ash, or equivalent, and of a length and diameter as given in Table 33.15-10 (c).

(d) Bucket. The bucket shall be of heavy gage galvanized iron, or other suitable corrosion-resistant metal, of not less than 2 gallon capacity, and shall have a 6-foot lanyard of 12-thread manila attached.

(e) Compass and mounting. The compass and mounting shall be of an approved type, constructed in accordance with U.S. Coast Guard Specification dated December 14, 1944.

(f) Ditty bag. The ditty bag shall consist of a canvas bag and shall contain a sailmaker's palm, needles, sail twine, marline and marlinspike.

(g) Drinking cups. Drinking cups shall be enamel coated or plastic, graduated in ounces, and be provided with lanyards 3 feet in length.

TABLE 33.15-10 (b)

Capacity of lifeboat, cubic feet		Bilge pump size
Over—	Not over—	
---	330	1
330	700	2
700	---	3

TABLE 33.15-10 (c)

Length of lifeboat (feet)		Boathook handles	
Over—	Not over—	Diameter (inches)	Length (feet)
---	23	1½	8
23	29	1¾	10
29	---	2	12

(h) Fire extinguisher. Fire extinguishers shall be of an approved type (4 pounds CO_2 or 2 pounds dry chemical). One shall be attached to each end of the lifeboat.

(i) First aid kit. The first aid kit shall be of an approved type, constructed and fitted in accordance with Subpart 160.041 of Subchapter Q (Specifications) of this chapter.

(j) Flashlight. The flashlight shall be of an approved Type I, Size No. 3, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter. Three spare cells (or one 3-cell battery) and two spare bulbs, stowed in a watertight container, shall be provided with each flashlight. Batteries shall be replaced yearly during the annual stripping, cleaning, and overhaul of the lifeboat.

(k) Hatchet. Hatchets shall be of an approved type, constructed in accordance with Subpart 160.013 of Subchapter Q (Specifications) of this chapter. They shall be attached to the lifeboat by individual lanyards and be readily available for use, one at each end of the lifeboat.

(l) Heaving line. The heaving line shall be of adequate strength, 10 fathoms in length, and one inch in circumference. It shall be of such quality as to be buoyant after 24 hours submergence.

(m) Jackknife. The jackknife (with can opener) shall be of an approved type, constructed in accordance with Subpart 160.043 of Subchapter Q (Specifications) of this chapter.

(n) Ladder, lifeboat gunwale. The lifeboat gunwale ladder shall consist of 3 flat wood steps cut out for handholds. The steps shall be spaced 12 inches apart and fastened with ⅝-inch diameter manila rope. Each rope end shall be tied inside the lifeboat at about amidships with the ladder stowed on top of the side benches and ready for immediate use. Other suitable devices may be specifically approved.

(o) Lantern. The lantern shall contain sufficient oil to burn for at least 9 hours, and shall be ready for immediate use.

(p) Lifeline. The lifeline shall be properly secured to both sides of the lifeboat along its entire length, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila. The bights shall hang to within 12 inches of the water when the lifeboat is light.

(q) Life preservers. Life preservers shall be of an approved type, constructed in accordance with the applicable subparts of Subchapter Q (Specifications) of this chapter.

(r) Locker. The locker shall be suitable for the storage and preservation of the small items of equipment.

(s) Mast and sail. A unit, consisting of a standing lug sail together with the necessary spars and rigging, shall be provided in general agreement with Table 33.15-10(s). The sails shall be of good quality canvas, or other material acceptable to the Commandant, colored Indian Orange (Cable No. 70072, Standard Color Card of America). Rigging shall consist of galvanized wire rope not less than three-sixteenths inch in diameter. The mast and sail shall be protected by a suitable cover.

(t) Matches. A box of safety matches in a watertight container stowed in an equipment locker or secured to the underside of the stern thwart if no locker is fitted.

(u) Milk, condensed. One pound of condensed milk shall be provided for each person the lifeboat is certified to carry, to be stowed in lockers or other compartments providing suitable protection.

(v) Mirrors, signaling. Signaling mirrors shall be of an approved type.

(w) Oars. A unit, consisting of a complement of rowing oars and steering oar, shall be provided for each lifeboat in accordance with Table 33.15-10(w), except that motor-propelled and hand-propelled lifeboats need only be equipped with 4 rowing oars and steering oar. All oars shall be buoyant.

(x) Oil, illuminating. One quart of illuminating oil shall be provided in a metal container.

(y) Oil, storm. One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

TABLE 33.15-10 (s)

Length of lifeboat (feet)		Standing lug sail										Mast [1]		Yard [1]	
Over—	Not over—	Area (square feet)	Luff and head lengths		Leach length		Foot length		Clew to throat		Ounces per square	Commercial designation No.	Length	Diameter (inches)	Length	Diameter (inches)
			Ft.	*In.*	*Ft.*	*In.*	*Ft.*	*In.*	*Ft.*	*In.*			*Ft.* *In.*		*Ft.* *In.*	
-------	17	58	5	11	12	1	8	10	10	10	14.35	10	11 2	3	6 11	2
17	19	74	6	8	13	8	10	0	12	2	14.35	10	12 6	3	7 8	2
19	21	93	7	5	15	1	11	2	13	8	14.35	10	13 10	3½	8 5	2½
21	23	113	8	3	16	11	12	4	15	1	14.35	10	15 2	3½	9 3	2½
23	25	135	9	0	18	6	13	6	16	6	14.35	10	16 6	4	10 0	3
25	27	158	9	9	20	0	14	7	17	10	17.50	8	17 10	4	10 9	3
27	29	181	10	5	21	5	15	7	19	1	17.50	8	19 2	4½	11 5	3¼
29	31	203	11	0	22	8	16	6	20	3	20.74	6	20 6	4½	12 0	3¼
31	[2]	[2]	[2]		[2]		[2]		[2]		[2]	[2]	[2]	[2]	[2]	[2]

[1] Mast lengths measured from heel to center of upper halyard sheave. Mast diameters measured at thwart. Mast and yard shall be of clear-grained spruce, fir, or equivalent.
[2] Subject to special consideration.

TABLE 33.15-10 (w)

Length of lifeboat (feet)		Number of oars		Length of oars (feet)	
Over—	Not over—	Rowing	Steering	Rowing	Steering
--	15	4	1	8	9
15	19	6	1	10	11
19	21	6	1	11	12
21	23	6	1	12	13
23	25	8	1	13	14
25	27	8	1	14	15
27	--	8	1	15	16

(z) Painter. Painters shall be of manila rope not less than 2¾ inches in circumference, or equivalent, and of a length not less than 3 times the distance between the deck on which the lifeboat is stowed and the light draft of the vessel. For lifeboats on vessels in ocean, coastwise or Great Lakes service one of the painters shall have a long eye splice and be attached to the thwart with a toggle. The other painter shall be attached to the stem.

(aa) Plug. The automatic drain required in the lifeboat shall be provided with a cap or plug attached to the lifeboat by a suitable chain.

(bb) Provisions. Two pounds of hard bread or its approved equivalent shall be provided for each person the lifeboat is certified to carry. The provisions shall be packaged in hermetically sealed cans of an approved type. The cans shall be stowed in lockers or other compartments providing suitable protection.

(cc) Rowlocks. A unit, consisting of sufficient rowlocks and rowlock sockets for each oar required by Table 33.15-10 (w) plus 2 additional rowlocks. The rowlocks shall be attached to the lifeboat by separate chains so as to be available for immediate use, except that the two additional spare rowlocks shall be carried in the equipment locker or stowed near the stern if no locker is fitted. The rowlocks and rowlock sockets shall be distributed so as to provide the maximum amount of single banked oars practicable.

(dd) Rudder and tiller. The rudder and tiller shall be constructed in accordance with Paragraph 160.035-3 (t) in Subpart 160.035 of Subchapter Q (Specifications) of this chapter.

(ee) Sea anchor. The sea anchor shall be of an approved type.

(ff) Signals, distress, floating orange smoke. Two approved floating orange smoke distress signals, constructed in accordance with Subpart 160.022 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to 3 years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(gg) Signals, distress, red hand flare. A unit, consisting of 12 approved hand red flare distress signals, in a watertight container, constructed in accordance with Subpart 160.021 or 160.023 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to 3 years from date of manufacture, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(hh) Signals, distress, red parachute flare. A unit, consisting of 12 approved parachute red flare distress signals, with an approved means of projecting them, all contained in a portable watertight container; or 12 approved hand-held rocket-propelled parachute red flare distress signals contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter. The service use of this equipment shall be limited to 3 years from date of manufacture, and replacement shall be

made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after the date of expiration.

(ii) Tool kit. The tool kit shall consist of at least the following tools contained in a suitable container:

(1) One 12-ounce ball peen hammer.
(2) One screwdriver with 6-inch blade.
(3) One pair 8-inch slip joint pliers.
(4) One 8-inch adjustable end wrench.

(jj) Water. (1) For each person the lifeboat is certified to carry, there shall be provided three quarts of drinking water consisting of nine approved hermetically sealed containers per person constructed and filled in accordance with Subpart 160.026 of Subchapter Q (Specifications) of this chapter. The service life of this equipment shall be limited to 5 years from date of packing, and replacement shall be made no later than the first annual stripping, cleaning, and overhaul of the lifeboat after date of expiration. Approved desalting kits capable of producing an equal amount of drinking water may be substituted for not more than one-third of the drinking water required to be carried.

(2) The drinking water containers shall be stowed in drinking water tanks, lockers, or other compartments providing suitable protection.

(kk) Whistle, signaling. The whistle shall be of the ball-type, of corrosion-resistant construction, with a 36-inch lanyard attached, and in good working order.

(ll) Fishing kit. The fishing kit shall be of approved type constructed in accordance with Subpart 160.061 of Subchapter Q (Specifications) of this chapter.

(mm) Cover, protecting. The protecting cover shall be of a highly visible color, and capable of protecting the occupants against injury by exposure.

(nn) Table of lifesaving signals. The table of lifesaving signals shall be in accordance with the provisions of Chapter V, Regulation 16, of the International Convention for Safety of Life at Sea, 1960, and shall be printed on water resistant paper.

(oo) Desalting kit. One or more approved desalting kits may be used as a substitute for one-third of the required amount of drinking water per person, and shall be constructed in accordance with Subpart 160.058 of Subchapter Q (Specifications) of this chapter.

33.15–15 Required equipment for rigid type liferafts and buoyant apparatus—TB/LBR. (a) The rigid type liferafts and buoyant apparatus for all vessels shall be equipped in accordance with Table 33.15–15(a). For a description of the items contained in this table and the units comprising the items, see the applicable paragraphs of Section 33.15–20. The letter identification prefixing the item in the table corresponds to the paragraph designation in Section 33.15–20.

TABLE 33.15–15 (a)

Letter identification	Item	Liferaft		Buoyant apparatus—All waters
		Great Lakes	Lakes, bays, sounds, rivers	
a	Boathook	1	1	None
b	Lifeline	[1] 1	[1] 1	[1] 1
c	Matches (boxes)	1	None	None
d	Oars (units)	[2] 1	[2] 1	None
e	Oil, storm (gallons)	1	None	None
f	Painter	1	1	[3] 1
g	Rowlocks (units)	[2] 1	[2] 1	None
h	Sea anchor	1	None	None
i	Signals, distress (units).	[2] 1	None	None
j	Water light	1	None	[4 5] 1

[1] Not required on Type A liferafts.
[2] For description of unit see Section 33.15–20.
[3] Need only be 2 inches in diameter and of a length equal to the distance between the deck where stowed to the vessel's light draft plus 6 feet.
[4] Not required on buoyant apparatus for less than 25 persons.
[5] Applies to ocean, coastwise and Great Lakes routes.

33.15–16 Required equipment for inflatable liferafts—TB/ALL. (a) Inflatable liferafts shall be equipped with ocean service equipment for vessels on ocean and coastwise routes and with limited service equipment for vessels on Great Lakes, lakes, bays, sounds, and river routes in accordance with Subpart 160.051 of Subchapter Q (Specifications) of this chapter.

NOTE: Subpart 160.051 of this chapter requires the servicing of inflatable liferafts at approved servicing facilities. Included in the servicing at an approved facility is a complete inspection of the required equipment by a marine inspector.

33.15–20 Description of equipment for liferafts and buoyant apparatus—TB/LBR—(a) Boathook. Boathooks shall be of the single hook ball point type. Boathook handles shall be of clear grained white ash, or equivalent, not less than 8 feet long and 1½ inches in diameter.

(b) Lifeline. The lifeline shall be properly secured around the sides and ends of the liferaft, or buoyant apparatus, festooned in bights not longer than 3 feet, with a seine float in each bight, which float may be omitted if the line is of an inherently buoyant material and absorbs little or no water. The lifeline shall be of a size and strength not less than ⅜-inch diameter manila.

(c) Matches. A box of safety matches in a watertight container.

(d) Oars. A unit, consisting of 4 rowing oars and one steering oar not less than 8 feet in length, shall be provided for liferafts for 7 persons or more. For liferafts for 6 persons or less, a unit shall consist of 2 paddles not less than 5 feet in length.

(e) Oil, storm. One gallon of vegetable, fish, or animal oil shall be provided in a suitable metal

container so constructed as to permit a controlled distribution of oil on the water, and so arranged that it can be attached to the sea anchor.

(f) Painter. Painters shall be of manila rope not less than 2¾ inches in circumference and of a length not less than 3 times the distance between the deck on which the liferafts are stowed and the light draft of the vessel.

(g) Rowlocks. A unit, consisting of 5 rowlocks attached to the liferaft by separate chains and ready for immediate use, together with proper rowlock sockets so arranged as to provide 4 rowing positions and 1 steering position with the liferaft floating either side up. Rowlocks and rowlock sockets are not required on liferafts for 6 persons or less.

(h) Sea anchor. The sea anchor shall be constructed of good quality canvas or other satisfactory material, and shall be not less than 2 feet in diameter.

(i) Signals, distress. (1) A unit, consisting of equipment as specified in subparagraph (2) or (3) of this paragraph. The service use of this equipment shall be limited to 3 years from date of manufacture, and replacement shall be made no later than the first inspection (biennial or reinspection) after the date of expiration.

(2) 12 parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container. Construction shall be in accordance with Subparts 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter.

(3) 6 approved hand red flare distress signals and 6 parachute red flare distress signals with an approved means of projecting them, all contained in a portable watertight container. Construction shall be in accordance with Subparts 160.021, 160.024 and 160.028 or 160.036 of Subchapter Q (Specifications) of this chapter.

(j) Water light. The water light shall be of an approved automatic electric type, constructed in accordance with Subpart 161.001 of Subchapter Q (Specifications) of this chapter. The water light shall be attached to the liferaft or buoyant apparatus by a 12-thread manila lanyard 3 fathoms in length.

33.15–25 Portable radiotelegraph apparatus—T/OC. (a) All tankships on an international voyage shall be provided with a portable radio apparatus complying with the requirements of the Federal Communications Commission unless at least one lifeboat on each side of the vessel is fitted with a fixed radio installation. Such portable radio shall be kept in the radio room, chartroom, or other suitable location ready to be moved to one or other of the lifeboats in the event of an emergency; however, in tankships of 3,000 gross tons and over in which lifeboats are fitted amidships and aft, such equipment shall be kept in a suitable place in the vicinity of those lifeboats which are furthest removed from the ship's main transmitter.

33.15–90 Lifeboat, liferaft and buoyant apparatus equipment on tank vessels contracted for prior to May 26, 1965—TB/ALL. (a) Vessels contracted for prior to May 26, 1965, shall meet the following requirements:

(1) Except as specifically modified by this paragraph, the requirements of Sections 33.15–5 through 33.15–25 shall be complied with insofar as the number of items of equipment and the method of stowage of the equipment is concerned.

(2) Existing items of equipment previously approved, but not meeting the applicable specifications or requirements set forth in Sections 33.15–5 through 33.15–25 may be continued in service so long as they are maintained in a good condition to the satisfaction of the Officer in Charge, Marine Inspection.

(3) Lifeboats previously approved without automatic drain plugs shall have two plugs or caps attached to the lifeboat by separate chains.

(4) On tank vessels certificated for ocean or coastwise service, and contracted for prior to November 19, 1952, unless other approved means are provided to achieve the same purpose, three ½-inch diameter manila grablines shall be fitted extending from gunwale to gunwale under the keel to enable persons to cling or to climb upon the upturned lifeboat. The ends of each grabline shall be securely attached to the side benches or other permanent part of the lifeboat and each grabline shall be made up with figure eight knots spaced approximately 18 inches apart in order to provide hand grips. Means shall be provided for taking up any slack in the grablines.

(5) All new installations shall meet the applicable specifications or requirements of this part.

SUBPART 33.20—STOWAGE OF LIFEBOATS, LIFERAFTS, AND BUOYANT APPARATUS

33.20–1 Davits and launching devices—TB/ALL. (a) Tankships of 100 gross tons or more shall be equipped with separate davits for each lifeboat carried.

(b) Tankships of less than 100 gross tons and tank barges where lifeboats are carried shall provide means for the launching of such lifeboats by davits or crane or, where the freeboard is less than 6 feet when the vessel has no cargo aboard, by slide.

(c) On all tankships of 500 gross tons and over in ocean and coastwise service, the conditions set forth in subparagraphs (1) to (5), inclusive, of this paragraph shall apply. Tankships of 500 gross tons and over in Great Lakes service shall comply with the conditions set forth in subparagraphs (1) and (3) of this paragraph.

(1) An approved ladder, constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter shall be provided at each set of davits to afford access to the lifeboats when waterborne.

(2) All davit installations shall have at least 2 lifelines fitted to a davit span. The lifelines shall be of such length as to reach the water at the lightest draft with the vessel listed 15 degrees either way.

(3) Suitable means shall be provided on vessels engaged on international voyages for illuminating the launching gear and the lifeboats during the process of launching the lifeboats from the stowed position until they are waterborne. Similar provisions shall be made on such vessels for the illumination of any liferaft stowage areas. For detailed requirements of such illumination for tank vessels contracted for on or after November 19, 1955, see Part 111 of Subchapter J (Electrical Engineering) of this chapter.

(4) On tankships the construction or conversion of which was started on or after November 19, 1952, where applicable, means shall be provided outside the machinery space to prevent the discharge of water into the lifeboats while they are being lowered. This shall consist of baffles to deflect the water down the vessel's side, reach rods or other means to close the discharge openings, or a remote means for stopping the pumps.

(5) Lifeboats on tankships contracted for on or after May 26, 1965, shall be fitted with skates or other suitable means to facilitate launching against an adverse list of up to 15 degrees. However, skates may be dispensed with if, in the opinion of the Commandant, the arrangements are such as to insure that the lifeboats can be satisfactorily launched without skates. For vessels contracted for prior to May 26, 1965, the foregoing shall apply unless in the opinion of the Officer in Charge, Marine Inspection, it is unreasonable or impracticable or the arrangement or construction of the vessel make their use unnecessary.

(d) Lifeboats shall not be placed in the bows of tankships. They shall be stowed in such positions as to insure safe launching.

(e) Suitable access to the lifeboats shall be provided to enable the crew to prepare the lifeboats for launching.

(f) Means shall be provided for bringing the lifeboats against the ship's side and holding them there so that persons may be safely embarked.

(g) On a tankship on which inflatable liferafts have been substituted for lifeboats, a launching device for each lifeboat to be used for rescue purposes shall be installed. Radial type davits or other means may be used in sheltered waters if acceptable to the Officer in Charge, Marine Inspection.

33.20-3 Embarkation aids into inflatable liferafts—T/ALL. (a) Where inflatable liferafts are substituted for lifeboats, unless freeboard at embarkation point is such that embarkation devices are not necessary, suitable arrangements shall be made for embarkation which shall include sufficient ladders or other suitable devices to facilitate embarkation into the inflatable liferafts when waterborne.

33.20-5 Lifeboat davit falls—T/ALL. All tankships over 1,000 gross tons shall be provided with covered tubs, boxes, or reels, in which to stow the running part of the lifeboat davit falls. Lifeboat falls shall not be painted.

33.20-10 Lifeboats and liferafts kept clear for launching—TB/ALL. The decks on which lifeboats or liferafts are carried shall be kept clear of freight or any other obstruction that would interfere with the immediate launching of the lifeboats or liferafts.

33.20-15 Stowage of lifeboats and liferafts—TB/ALL. (a) All the lifeboats and liferafts shall be stowed in such a way that they can be launched in the shortest possible time, and that, even under unfavorable conditions of list and trim from the point of view of the handling of the lifeboats and liferafts, it may be possible to embark in them as large a number of persons as possible.

(b) For tankships, arrangements shall be such that it may be possible to launch on either side of the vessel as large a number of lifeboats and liferafts as possible.

(c) Where practicable, lifeboat chocks shall be so fitted that the lifeboats they serve shall not require lifting before launching.

(d) Inflatable liferafts shall be stowed in such a manner that they will float free in the event of the vessel sinking. Stowage and launching arrangements shall be to the satisfaction of the Officer in Charge, Marine Inspection.

33.20-20 Hydraulic releases—TB/ALL. (a) Hydraulic releases approved under Subpart 160.062 of Subchapter Q (Specifications) of this chapter, and spring-tensioned gripes may be permitted in the installation of any liferaft, inflatable liferaft, or buoyant apparatus. On and after July 1, 1969, only hydraulic releases approved under Subpart 160.062 of this chapter may be used.

(b) Existing hydraulic releases may be returned to their manufacturers or to repair facilities designated by their manufacturers for the purpose of determining compliance with Subpart 160.062 of this chapter. If such a release passes the periodic servicing and testing requirements in paragraph 160.062-4(f) of this chapter and the reconditioning work (if any) is done to the satisfaction of the Officer in Charge, Marine Inspection, the complete body marking and inspection tagging required by Section 160.062-5 of this chapter shall be placed on such a release indicating it is an approved item.

SUBPART 33.25—MARKINGS, CARE AND INSPECTION

33.25–5 Numbering and marking of lifeboats—TB/ALL. (a) The number of each lifeboat shall be plainly marked or painted on each side of the bow in figures 3 inches high; and, where lifeboats are carried on both sides of a vessel, the odd-numbered boats shall be stowed on the starboard side, and the even-numbered boats on the port side; i.e., lifeboat No. 1 shall be forward on the starboard side, and lifeboat No. 3 next abaft lifeboat No. 1; lifeboat No. 2 shall be forward on the port side and lifeboat No. 4 next abaft lifeboat No. 2, etc.

(b) The cubical contents and number of persons allowed to be carried on each lifeboat shall be plainly marked or painted on each side of the bow in letters and numbers 1½ inches high. For vessels on an international voyage, the vessel's port of registry shall be added in similar type letters. In addition, the number of persons allowed shall be plainly marked or painted on the top of at least two of the thwarts in letters and numbers 3 inches high.

(c) Such letters and numbers shall be dark on a light ground or light on a dark ground.

(d) The top of thwarts, side benches and footings of lifeboats shall be painted or otherwise colored international orange. The area in way of the red mechanical disengaging gear control lever, from the keel to the side bench, shall be painted or otherwise colored white, to provide a contrasting background for the lever. This band of white should be approximately 12 inches wide depending on the internal arrangements of the lifeboat.

(e) Where mechanical disengaging apparatus is used, the control effecting the release of the lifeboat shall be painted bright red and shall have thereon in raised letters either the words—"Danger—Lever Drops Boat," or the words—"Danger—Lever Releases Hooks."

33.25–10 Marking of liferafts—TB/ALL. (a) There shall be stenciled in a conspicuous place on each rigid type liferaft the number of persons the liferaft can carry.

(b) There shall be stenciled in a conspicuous place in the immediate vicinity of each inflatable liferaft the following:

INFLATABLE LIFERAFT NO. ------

PERSONS CAPACITY

These markings shall not be placed on the inflatable liferaft containers.

NOTE: § 160.051–8(n) of Subchapter Q (Specifications) of this chapter requires permanently attached nameplates on each inflatable liferaft and carrying case. The name plate contains the following information: The name of manufacturer, approval number, manufacturer's model number, serial number and lot number, and the number of persons for which the inflatable liferaft is approved. In addition, the carrying case shall be marked "Ocean Service Equipment" or "Limited Service Equipment" as applicable, together with the marine inspector's initials, the date, and the letters "USCG."

33.25–15 Overhaul—TB/ALL. (a) All lifeboats, rescue boats, and rigid type liferafts shall be stripped, cleaned and thoroughly overhauled at least once in every year.

(b) Tank vessels in ocean or coastwise service having a sufficient number of lifeboats on each side to accommodate all persons on board may care for their lifeboats at sea: *Provided*, That a number of lifeboats sufficient to accommodate all persons on board are fully equipped and ready for use at all times.

(c) The lifeboat davits and falls shall be overhauled at least once in every year.

(d) Inflatable liferafts shall be serviced at an approved servicing facility in accordance with the provisions of Subpart 160.051 of Subchapter Q (Specifications) of this chapter. Inflatable liferafts shall be serviced at an approved servicing facility every 12 months or not later than the next vessel inspection for certification provided the total time since date of last servicing does not exceed 15 months. The period for servicing is computed from date of last servicing. Except in emergencies no servicing should be done aboard vessels. If at any time external damage is found to the container or straps or if the seal is broken, the Officer in Charge, Marine Inspection, shall be notified and the raft shall be serviced by an approved servicing facility.

NOTE: After the raft has been satisfactorily serviced in the presence of a marine inspector at an approved servicing facility, the raft is repacked and sealed and the carrying case stamped "PASSED" together with the date, port, and the marine inspector's initials.

(e) A hydraulic release used in the installation of any liferaft, inflatable liferaft, or buoyant apparatus shall undergo the periodic servicing and testing required by Subpart 160.062 of Subchapter Q (Specifications) of this chapter every 12 months which may be extended to 15 months as determined by the date shown on its inspection tag. The springs of a spring-tensioned gripe used in such an installation shall be renewed when the accompanying hydraulic release is serviced and tested.

33.25–20 Maintenance—TB/ALL. (a) Every lifeboat, liferaft, or piece of buoyant apparatus together with its equipment shall be kept in every respect in good condition and ready for immediate use.

(b) The material that may support the platform of a liferaft or buoyant apparatus shall be examined to determine that its strength is maintained.

(c) Air tanks shall be examined to see that they are in good condition but pressure need not be applied unless the inspector so desires to assure himself as to their condition.

(d) Disengaging apparatus, blocks and falls, if used, shall be determined to be in good condition.

(e) Disengaging apparatus, if used, shall be shown on the inspector's report, and if the inspector is unable to identify it by name, he shall take the matter up with the Coast Guard District Commander in order that such apparatus may be traced for identification and approval record.

SUBPART 33.30—MANNING OF LIFEBOATS AND LIFERAFTS

33.30-1 Persons in charge of each lifeboat and liferaft—T/O. A licensed deck officer, an able seaman, or a certificated lifeboatman shall be placed in charge of each lifeboat or liferaft. He shall have a list of its lifeboatmen and other members of its crew which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations. A second in command shall also be appointed which person shall be either a licensed deck officer, an able seaman or a certificated lifeboatman.

33.30-3 Person in charge of each lifeboat or liferaft—T/CLB. (a) A licensed deck officer, an able seaman, or a certificated lifeboatman shall be placed in charge of each lifeboat or liferaft.

(b) The person in charge shall have a list of its lifeboatmen and other members of its crew, which shall be sufficient for her safe management, and shall see that the men placed under his orders are acquainted with their several duties and stations.

33.30-5 Manning of lifeboats and liferafts—TB/OCLB. (a) There shall be for each lifeboat or liferaft a number of lifeboatmen at least equal to that specified as follows, provided, that vessels required to carry sufficient lifeboats on each side to accommodate all persons on board need only carry the lifeboatmen required for the lifeboats on one side:

(1) If the lifeboat or liferaft carries 25 persons or less, the minimum number of certificated lifeboatmen shall be 1;

(2) If the lifeboat or liferaft carries 26 persons and less than 41 persons the minimum number of certificated lifeboatmen shall be 2;

(3) If the lifeboat or liferaft carries 41 persons and less than 61 persons the minimum number of certificated lifeboatmen shall be 3.

(b) The allocation of the certificated lifeboatmen to each lifeboat and liferaft remains within the discretion of the master, according to the circumstances.

33.30-10 Motor-propelled lifeboat—TB/ALL. (a) The master shall assign to each motor-propelled lifeboat a man capable of working the motor.

33.30-15 Lifeboat carrying a radio-telegraph and/or searchlight—TB/ALL. (a) The master shall assign to each lifeboat carrying a radiotelegraph and/or searchlight a man capable of operating such equipment.

SUBPART 33.35—LIFE PRESERVERS

33.35-1 Number and type required—TB/ALL. (a) All tank vessels shall be provided with one approved life preserver for each person carried. An additional number of life preservers shall be provided for personnel on watch in the engineroom and pilothouse, and at the bow lookout.

(b) When children are carried, a suitable number of children's life preservers shall be provided.

(c) All life preservers on tankships of 500 gross tons and over on an international voyage shall be provided with a whistle of the ball-type, of corrosion-resistant construction, with a 3-foot lanyard attached, and in good working order. It shall be attached to the life preserver by the lanyard alone without hooks, snaps, clips, etc., and shall extend not less than 15 inches from the life preserver body. While stowed on the life preserver, the whistle lanyard shall be coiled and stopped-off.

(R.S. 4491, as amended; 46 U.S.C. 489)

33.35-5 Distribution and stowage—TB/ALL. Life preservers shall be distributed throughout the cabins, staterooms, berths, and other places convenient for each person on such tank vessels. The stowage of the additional number of life preservers shall be such that they are readily accessible to personnel on watch in the engineroom and pilothouse, and at the bow lookout.

33.35-10 Shipboard inspections—TB/ALL. At each inspection for certification, or oftener if deemed necessary, the life preserver shall be examined by an inspector to determine serviceability. When life preservers are found to be in accordance with the requirements, the inspector shall stamp them with the word "Passed," his initials, port, and date. Life preservers found not to be in a serviceable condition shall be removed from the vessel's equipment and, if beyond repair, shall be destroyed in the presence of the inspector.

33.35-15 Requirements for life preservers—TB/ALL. (a) The specifications regarding life preservers are in Subparts 160.001, 160.002, 160.005, 160.006, and 160.055 of Subchapter Q (Specifications) of this chapter.

(b) Cork and balsa wood life preservers, constructed in accordance with the applicable provisions of Subpart 160.003 or 160.004 and manufactured as approved life preservers prior to July 1, 1965, may be accepted as new or replacement equipment required by this subchapter if such life preservers are serviceable and in good condition to the satisfaction of the Officer in Charge, Marine Inspection: *Provided, however,* That such life preservers bearing basic Approval No. 160.003 or 160.004 shall not be considered as approved equip-

ment meeting the requirements for those tankships on an international voyage, constructed or contracted for on or after May 26, 1965.

(c) All kapok and fibrous glass life preservers which do not have plastic-covered pad inserts, as required by Subparts 160.002 and 160.005 of Subchapter Q (Specifications) of this chapter, shall be removed from service.

SUBPART 33.40—RING LIFE BUOYS AND WATER LIGHTS

33.40-1 Ring life buoys and water lights, general requirements—TB/ALL. (a) All ring life buoys shall be of an approved type, constructed in accordance with Subpart 160.009 or 160.050 of Subchapter Q (Specifications) of this chapter.

(b) All water lights shall be of an approved automatic electric type, constructed in accordance with Subpart 161.001 of Subchapter Q (Specifications) of this chapter.

(c) All self-activated smoke signals shall be of an approved type, constructed in accordance with the requirements of Subpart 160.057 of Subchapter Q (Specifications) of this chapter, which shall be capable of producing smoke of a highly visible color for at least 15 minutes.

(R.S. 4491, as amended; 46 U.S.C. 489)

33.40-5 Number required on tankships—T/ALL. (a) The minimum number of approved 30-inch ring life buoys, and the minimum number of which shall have water lights attached, shall be in accordance with Table 33.40-5(a).

TABLE 33.40-5(a)

Length of tankship (feet)	Ocean[1]		All services other than ocean [1]	
	Minimum number of ring life buoys	Minimum number of ring life buoys in column 2 which shall have water lights attached	Minimum number of ring life buoys	Minimum number of rings in column 4 which shall have water lights attached
Column 1	Column 2	Column 3	Column 4	Column 5
Under 100	3	2	2	1
100 and under 200	6	3	4	2
200 and under 300	8	6	6	2
300 and under 400	12	6	12	4
400 and under 600	18	9	18	9
600 and under 800	24	12	24	12
800 and over	30	15	30	15

[1] Vessels 500 gross tons and over on an international voyage, regardless of length, shall carry at least 8 life buoys; half of which shall have water lights attached.

(b) One of the ring life buoys on each side of the vessel shall have secured to it a line at least 15 fathoms in length. On tankships on an international voyage, the line shall be of the buoyant type.

(c) On tankships on an international voyage, at least two of the ring life buoys with water-lights attached as required by Table 33.40-5(a), shall also be provided with an approved self-activated smoke signal and shall be capable of quick release from the bridge.

(d) On tankships on an international voyage, the ring life buoys required by this section shall be orange in color.

33.40-10 Number required on tank barges—B/ALL. All tank barges regardless of size. shall have at least two approved 30 inch ring life buoys on board: *Provided*, That unmanned barges are exempt from this section.

33.40-15 Distribution and security—TB/ALL. (a) All ring life buoys shall be placed so as to be readily accessible to the persons on board, and their positions plainly indicated so as to be known to all persons concerned.

(b) The ring life buoys shall always be capable of being cast loose, and shall not be permanently secured in any way.

SUBPART 33.45—DISTRESS SIGNALS

33.45-1 Distress signals—T/ALL and B/OC. On every manned tank vessel of 150 gross tons and over there shall be carried 12 approved hand red flare distress signals in a watertight container, or 12 approved hand combination flare and smoke distress signals in a watertight container. Service use shall be limited to a period of three years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within twelve months after the date of expiration. Distress signals not bearing date of manufacture shall not be carried. For specifications for these signals, see Subparts 160.021 and 160.023 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489)

33.45-5 Parachute distress signals—T/OC. In addition to the equipment required by Section 33.45-1, all tankships of 500 gross tons and over shall be provided with 12 approved hand-held rocket-propelled parachute red flare distress signals, contained in a portable watertight container, constructed in accordance with Subpart 160.036 of Subchapter Q (Specifications) of this chapter. Service use of the distress signals shall be limited to a period of 3 years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such distress signals are available, except that replacement shall be made in all cases within 12 months after the date of expiration.

33.45-10 Stowage of distress signals—TB/ALL. All tank vessels required to carry pyrotechnic distress signals shall carry such signals in watertight containers near the pilothouse, on the navigator's bridge, or in some other suitable, read-

ily accessible location other than in the lifeboats. In no case shall pyrotechnics be permitted to be carried in enclosed spaces, adjacent to cargo tanks or near sources of heat. Tank vessels required to carry a magazine chest may carry the distress signals in the magazine chest.

SUBPART 33.50—SIGNALING LAMP

33.50-1 Signaling lamp—T/O. Tankships of over 150 gross tons engaged on international voyages shall be equipped with an efficient daylight signaling lamp. For detailed requirements see Subpart 113.60 of Subchapter J (Electrical Engineering) of this chapter.

SUBPART 33.55—LINE-THROWING APPLIANCES

33.55-1 Line-throwing appliances required—T/OC. (a) All ocean and coastwise tankships of 150 gross tons and over shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, as specified in this subpart.

(b) Tankships of 500 gross tons or more shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, of the impulse-projected rocket type, the requirements for which are set forth in Subpart 160.040 of Subchapter Q (Specifications) of this chapter. Lyle gun type line-throwing appliances in service on or before July 1, 1951, may be continued in use so long as in good and serviceable condition: *Provided*, That any replacements shall be made with a line-throwing appliance of the impulse-projected rocket type.

(c) Tankships of 150 gross tons and over and less than 500 gross tons shall be equipped with an approved line-throwing appliance and equipment auxiliary thereto, of the shoulder gun type or the impulse-projected rocket type, the requirements for which are set forth in Subparts 160.031 and 160.040, respectively, of Subchapter Q (Specifications) of this chapter. Lyle gun type line-throwing appliances in service on or before July 1, 1951, may be continued in use so long as in good and serviceable condition: *Provided*, That any replacements shall be made with a line-throwing appliance of the shoulder gun type or the impulse-projected rocket type.

(d) Service use of rockets shall be limited to a period of 4 years from date of manufacture, and replacement of out-dated items shall be made at the first port of arrival in the United States where such rockets are available, except that replacement shall be made in all cases within 12 months after the date of expiration.

(R.S. 4491, as amended; 46 U.S.C. 489)

33.55-5 Accessibility—T/OC. The line-throwing appliance and its equipment shall be kept always easily and immediately accessible and ready for use. No part of this equipment shall be used for any other purpose.

33.55-10 Equipment for line-throwing appliances—T/OC. The equipment enumerated below is required to be carried with the various types of line-throwing appliances:

(a) Impulse-projected rocket type. Four (4) rockets (2 of which shall be of the buoyant type), 4 primer-ejector cartridges, 4 service lines (each of a length not less than that specified in the approval of the appliance carried, of 7/32-inch to 9/32-inch diameter, of flax or manila, and having a breaking strength of at least 500 pounds, to be kept in faking boxes or on reels), 1 auxiliary line (1,500 feet of 3-inch circumference manila), 1 can of oil, 1 cleaning brush, 12 wiping patches, and 1 set of instructions furnished by the manufacturer, all in a suitable case or box with the appliance, except that the service lines and the auxiliary line may be stowed in an accessible location nearby.

(b) Shoulder gun type. Ten (10) service projectiles, 4 service lines (each not less than 400 feet in length of 3/8-inch circumference flax or cotton and having not less than 250 pounds breaking strength, or each not less than 600 feet in length of 1/16-inch or more diameter woven or braided nylon, very flexible, having a breaking strength not less than 140 pounds, or equivalent, to be kept in faking boxes or reels), 25 cartridges, 1 cleaning rod with brush, 1 can of oil, 12 wiping patches and 1 set of instructions, all in a suitable case or box with the gun, with an auxiliary line (500 feet of 3-inch circumference manila) accessible for use.

(c) Lyle gun type on existing tank vessels. Six (6) service projectiles, 4 service lines (each 1,700 feet of 7/32-inch to 9/32-inch diameter flax or manila, having not less than 500 pounds breaking strength, in faking boxes or reels), 1 auxiliary line (1,500 feet of 3-inch circumference manila), 1 approved firing attachment (with accessories consisting of lanyard, wrench, washer to fit between barrel and shoulder of firing attachment, blank plug for screwing into gun when firing attachment is not in place, cartridge extractor, and 25 primers in watertight metal box), 18 bags (2½ ounces each) of black powder marked "One-half normal charge for Lyle gun, 2½ ounces black powder" in nonferrous metal screw top container, 25 paper wads, 1 ram rod, 1 wire brush, 1 can light petrolatum, 12 wiping patches, 1 tapered wooden plug for muzzle of gun when not in use, and 1 set of instructions furnished by the manufacturer of the gun, all in a suitable box or chest with the gun.

33.55-15 Service recommendations—T/OC. The following precautions and procedure are recommended for the use of line-throwing appliances and equipment:

(a) Impulse-projected rocket type. Follow the operating instructions and safety precautions furnished by the manufacturer.

(b) Shoulder gun type. Follow the operating instructions and safety precautions furnished by the manufacturer.

(c) Lyle gun type on existing tank vessels. (1) Service powder charge should be about 5 ounces of black powder, and the powder bags should be furnished to the vessel containing 2½ ounces of black powder and marked "one-half normal charge." Under extraordinary circumstances, 7½ ounces (three 2½-ounce bags) of black powder may be used.

(2) In making the line fast to the shank, pass it through the eye and take three or more half-hitches around its own part, leaving a loop of about 10 to 12 inches and taking the hitches about 6 inches apart. This will allow the line to slip slightly through the eye of the shank before the hitches fetch up, thus easing the strain on the line at the loop during the initial acceleration.

(3) A considerable bight led over the side is recommended wherever possible, as it will tend to lessen the jerk on the line at initial acceleration.

(4) At least a fathom of the line from the shank should be thoroughly wet before using to prevent burning.

(5) The faking box or reel should always be faced in the direction of the line of fire and placed abreast of the gun and as close to ship's side as possible. It is not advisable to place the line too close to the muzzle of the gun, as the concussion may lift several layers or coils from the top, causing a snarl which in turn may cause the line to part.

(6) Care should be taken in placing the equipment to prevent fouling of the line in rigging, ridge ropes, etc., which have a tendency to rise or jump up when the gun is fired.

(7) Having made the gun and equipment ready for use, the following procedure in firing is recommended: select a place where the gun may recoil without striking anything, or where it may be securely lashed down. Note the position of the vessel to be relieved, and the direction and approximate force of the wind, and then place the gun in position, making allowance for the drift of the line. Place the line on the windward side of the gun and about 3 feet from it. Make the line fast in the eye of the shank and insert the powder charge, projectile, and primer. In loading, make sure that the projectile is seated against the wad.

(8) After using, the line should be thoroughly dried before rewinding or faking.

PART 34—FIREFIGHTING EQUIPMENT

SUBPART 34.01—APPLICATION

Sec.
34.01-1 General—TB/ALL.
34.01-5 Equipment Installed But Not Required—TB/ALL.
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SUBPART 34.05—FIREFIGHTING EQUIPMENT, WHERE REQUIRED

34.05-1 Fire Main System—T/ALL.
34.05-5 Fire-Extinguishing Systems—T/ALL.
34.05-10 Portable and Semiportable Extinguishers—TB/ALL.
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34.10-1 Application—TB/ALL.
34.10-5 Fire Pumps—T/ALL.
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SUBPART 34.13—STEAM SMOTHERING SYSTEM, DETAILS

34.13-1 Application—T/ALL.
34.13-90 Installations Contracted for Prior to January 1, 1962—T/ALL.

SUBPART 34.15—CARBON DIOXIDE EXTINGUISHING SYSTEMS, DETAILS

34.15-1 Application—T/ALL.
34.15-5 Quantity, Pipe Sizes, and Discharge Rates—T/ALL.
34.15-10 Controls—T/ALL.
34.15-15 Piping—T/ALL.
34.15-20 Carbon Dioxide Storage—T/ALL.
34.15-25 Discharge Outlets—T/ALL.
34.15-30 Alarms—T/ALL.
34.15-35 Enclosure Openings—T/ALL.
34.15-40 Pressure Relief—T/ALL.
34.15-90 Installations Contracted for Prior to January 1, 1962—T/ALL.

SUBPART 34.17—FIXED FOAM EXTINGUISHING SYSTEMS, DETAILS

34.17-1 Application—T/ALL.
34.17-5 Quantity of Foam Required—T/ALL.
34.17-10 Controls—T/ALL.
34.17-15 Piping—T/ALL.
34.17-20 Discharge Outlets—T/ALL.
34.17-25 Additional Protection Required—T/ALL.
34.17-90 Installations Contracted for Prior to January 1, 1962—T/ALL.

SUBPART 34.20—DECK FOAM SYSTEM, DETAILS

34.20-1 Application—T/ALL.
34.20-3 Cargo area definition—T/ALL.
34.20-5 Quantity of Foam Required—T/ALL.
34.20-10 Controls—T/ALL.
34.20-15 Piping—T/ALL.
34.20-20 Discharge Outlets—T/ALL.
34.20-90 Installations Contracted for Prior to January 1, 1962—T/ALL.

SUBPART 34.25—WATER SPRAY EXTINGUISHING SYSTEMS, DETAILS

34.25-1 Application—T/ALL.
34.25-5 Capacity and arrangement—T/ALL.
34.25-10 Controls—T/ALL.
34.25-15 Piping—T/ALL.
34.25-20 Spray nozzles—T/ALL.
34.25-90 Installations contracted for prior to January 1, 1964—T/ALL.

SUBPART 34.50—PORTABLE AND SEMIPORTABLE EXTINGUISHERS

34.50-1 Application—TB/ALL.
34.50-5 Classification—TB/ALL.
34.50-10 Location—TB/ALL.
34.50-15 Spare Charges—TB/ALL.
34.50-90 Vessels Contracted for Prior to January 1, 1962—TB/ALL.

SUBPART 34.55—SAND

34.55-1 Application—TB/ALL.
34.55-5 Amount Required—TB/ALL.
34.55-10 Substitute—TB/ALL.

SUBPART 34.60—FIRE AXES

34.60-1 Application—T/ALL.
34.60-5 Number Required—T/ALL.
34.60-10 Location—T/ALL.

AUTHORITY: The provisions of this Part 34 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.

SUBPART 34.01—APPLICATION

34.01-1 General—TB/ALL. (a) The provisions of this part shall apply to all tank vessels except as otherwise noted in this part.

34.01-5 Equipment installed but not required—TB/ALL. (a) Where firefighting equipment is not required, but is installed, the equipment and its installation shall be of an approved type.

34.01-10 Protection for unusual arrangements or special products—TB/ALL. (a) The provisions of this part contemplate fire protection for tank vessels of conventional design carrying the usual liquid petroleum products in internal tanks. Whenever unusual arrangements exist or special cargoes are carried upon which the vessel's normal firefighting equipment will be ineffective, additional suitable firefighting equipment of approved type shall be carried.

SUBPART 34.05—FIREFIGHTING EQUIPMENT, WHERE REQUIRED

34.05-1 Fire main system—T/ALL. (a) Fire pumps, piping, hydrants, hose and nozzles shall be installed on all tankships.

(b) The arrangements and details of the fire main system shall be as set forth in Subpart 34.10.

34.05-5 Fire-extinguishing systems—T/ALL. (a) Approved fire-extinguishing systems shall be installed on all tankships in the following locations:

(1) Dry cargo compartments. A carbon dioxide or water spray system shall be installed for the protection of all dry cargo compartments. On vessels contracted for prior to January 1, 1962, a steam smothering system may be used in lieu thereof. In any case, where such dry cargo compartments are readily accessible by means of doors such spaces need be protected only by the fire main system.

(2) Cargo tanks. A deck foam system shall be installed for the protection of all cargo tank spaces. Where a deck foam system is installed, an approved inert gas, steam or other system may also be installed for purposes of fire prevention or inerting of cargo tanks. For vessels under 100 feet in length, the semiportable equipment required by footnote 1 of Table 34.10-5(a) will be considered as meeting the requirements of this subparagraph. On vessels contracted for prior to January 1, 1962, a steam smothering, inert gas, fixed foam or carbon dioxide system may be used in lieu of the deck foam system for the protection of the cargo tank spaces.

(3) Lamp and paint lockers and similar spaces. A carbon dioxide or water spray system shall be installed in all lamp and paint lockers, oil rooms, and similar spaces. Vessels contracted for prior to January 1, 1962, shall have a carbon dioxide, water spray, or steam smothering system. Vessels contracted for prior to November 19, 1952, shall have a carbon dioxide water spray, steam smothering, or foam system.

(4) Pumprooms. A carbon dioxide, inert gas, foam or water spray system shall be installed for the protection of all pumprooms. Vessels contracted for prior to January 1, 1962, and after July 1, 1951, shall have the same protection or a steam smothering system. For vessels contracted for prior to July 1, 1951, such systems are not required but if installed shall meet the requirements of this section.

(5) Boilerrooms. On tankships contracted for on or after November 19, 1952, a carbon dioxide or foam system shall be installed for the protection of all spaces containing oil fired boilers, either main or auxiliary, their fuel oil service pumps and/or such fuel oil units as the heaters, strainers, valves, manifolds, etc., that are subject to the discharge pressure of the fuel oil service pumps.

(6) Machinery spaces. A carbon dioxide system shall be installed for the protection of machinery spaces containing internal combustion propelling engines using fuel having a flashpoint of less than 110 degrees F.

(7) Internal combustion installations. Fire-extinguishing systems shall be provided for internal combustion installations in accordance with the following:

(i) If a fire-extinguishing system is installed to protect an internal combustion installation, the system shall be of the carbon dioxide type.

(ii) On vessels of 1,000 gross tons and over on an international voyage, the construction or conversion of which is contracted for on or after May 26, 1965, a fixed carbon dioxide system shall be installed in all spaces containing internal combustion or gas turbine main propulsion machinery, auxiliaries with an aggregate power of 1,000 b.h.p. or greater, or their fuel oil units, including purifiers, valves, and manifolds.

(iii) On vessels of 1,000 gross tons and over, the construction, conversion or automation of which is contracted for on or after January 1, 1968, a fixed carbon dioxide system shall be installed in all spaces containing internal combustion or gas turbine main propulsion machinery, auxiliaries with an aggregate power of 1,000 b.h.p. or greater, or their fuel oil units, including purifiers, valves and manifolds.

(8) Enclosed ventilating system. On tankships contracted for on or after January 1, 1962, where an enclosed ventilating system is installed for electric propulsion motors or generators, a carbon dioxide extinguishing system shall be installed in such system.

The arrangements and details of the fire-extinguishing systems shall be as set forth in Subparts 34.10 through 34.20.

34.05-10 Portable and semiportable extinguishers—TB/ALL. (a) Approved portable and semiportable extinguishers shall be provided for all tank vessels.

(b) The type, size, location and arrangement of portable and semiportable extinguishers shall be as set forth in Subpart 34.50.

34.05-15 Sand—TB/ALL. (a) All spaces containing oil fired boilers shall have available in such spaces sand or an acceptable substitute.

(b) The arrangement and details of the carriage of the sand shall be as set forth in Subpart 34.55.

34.05-20 Fire axes—T/ALL. (a) Fire axes shall be provided on all tankships.

(b) The location and arrangement of fire axes shall be as set forth in Subpart 34.60.

SUBPART 34.10—FIRE MAIN SYSTEM, DETAILS

34.10-1 Application—TB/ALL. (a) On all tankships the provisions of this subpart, with the

exception of Section 34.10–90, shall apply to all fire main installations contracted for on or after May 26, 1965. Installations contracted for prior to May 26, 1965, shall meet the requirements of Section 34.10–90.

(b) If a fire main system is installed on a tank barge, the system shall meet the intent of this subpart insofar as reasonable and practicable.

34.10–5 Fire pumps—T/ALL. (a) Tankships shall be equipped with independently driven fire pumps in accordance with Table 34.10–5(a).

TABLE 34.10–5(a)—FIRE PUMPS

Size vessel, L.O.A.		Minimum number of pumps	Powerful streams of water per pump	Minimum hydrant and hose size	
Over—	Not over—			Exterior stations	Interior stations
(*Feet*)	(*Feet*)			(*Inches*)	(*Inches*)
	100	[1]			
100	250	[2] 1	[3] 2	1½	1½
250	400	2	[3] 2	1½	1½
400	650	2	[3] 2	[4] 2½	1½
650		2	[3] 3	[4] 2½	1½

[1] Vessels of 65 feet and not over 100 feet shall be equipped with 2 B–V extinguishers. (Refer to Table 34.50–5(c).) Vessels under 65 feet shall be equipped with 1 B–V extinguisher. (Refer to Table 34.50–5(c).)

[2] Vessels of 1,000 gross tons and over on an international voyage shall have at least 2 fire pumps.

[3] From hydrants having greatest pressure drop between fire-pump(s) and nozzles.

[4] Where 2½-inch hydrant size is required, two 1½-inch outlets may be substituted therefor with two 1½-inch hoses.

(b) Each pump shall be capable of delivering simultaneously the number of streams of water required by Table 34.10–5(a) from the outlets having the greatest pressure drop between fire pump(s) and nozzles at a Pitot tube pressure of approximately 75 p.s.i. Where 1½-inch hose is permitted in lieu of 2½-inch hose by footnote 3 of Table 34.10–5(a), the pump capacity shall be determined on the basis that both hoses are used.

(c) On tankships of 1,000 gross tons and over on an international voyage, each required fire pump, while delivering water through the fire main system at a pressure corresponding to that required by paragraph 34.10–15(e), shall have a minimum capacity of at least two-thirds of that required for an independent bilge pump if no length correction is taken for the cargo tank space. However, in no case shall the capacity of each fire pump be less than that otherwise required by this section.

(d) Fire pumps shall be fitted on the discharge side with relief valves set to relieve at 25 p.s.i. in excess of the pressure necessary to maintain the requirements of paragraph (b) of this section.

(e) Fire pumps shall be fitted with a pressure gage on the discharge side of the pumps.

(f) Fire pumps may be used for other purposes provided at least one of the required pumps is kept available for use on the fire system at all times. Unless specifically approved by the Commandant no branch lines shall be connected to the fire mains for other than fire, deck wash or tank cleaning purposes. Other discharge lines shall lead from a discharge manifold near the fire pump. In no case shall a pump having connection to an oil line be used as a fire pump.

(g) On all vessels where two fire pumps are required, they shall be located in separate spaces, and the arrangement of pumps, sea connections, and sources of power shall be such as to insure that a fire in any one space will not put all of the fire pumps out of operation. However, where it is shown to the satisfaction of the Commandant that it is unreasonable or impracticable to meet this requirement due to the size, or arrangement of the vessel, or for other reasons, the installation of a total flooding carbon dioxide system may be accepted as an alternate method of extinguishing any fire which would affect the powering and operation of at least one of the required fire pumps.

34.10–10 Fire station hydrants, hose and nozzles—T/ALL. (a) The size of fire station hydrants and hose required shall be as noted in Table 34.10–5(a).

(b) Fire hydrants shall be of sufficient number and so located that any part of living quarters, storerooms, working spaces and weather decks accessible to crew while at sea may be reached with two effective spray patterns of water, one of which shall be from a single 50-foot length of hose. In main machinery spaces all portions of such spaces shall be capable of being reached by at least 2 effective spray patterns of water, each of which shall be from a single 50-foot length of hose from separate outlets.

(c) The outlets at the fire station hydrant shall be limited to any position from the horizontal to the vertical pointing downward so that hose will lead horizontally or downward to minimize possibility of kinking.

(d) All fire station hydrants shall be equipped with spanners suitable for use on the hose at that station.

(e) Each fire station hydrant shall be provided with at least one length of hose with approved combination nozzle attached. A suitable hose rack or other device shall be provided. Hose racks on weather decks shall be located so as to afford protection from heavy seas. The hose shall be stored in the open or so as to be readily visible.

(f) The pipes and fire station hydrants shall be so placed that the firehose may be easily coupled to them. All hydrants shall be so located as to be readily accessible. If deck cargo is carried, it shall not interfere with access to the fire station hydrants, and the pipes shall be arranged as far as practicable to avoid risk of damage by such cargo.

(g) Each fire station hydrant or "y" branch shall be equipped with a valve so that the hose may

be removed while there is pressure on the fire main.

(h) Fire station hydrant connections shall be brass, bronze, or other equivalent metal. National Standard firehose coupling threads shall be used for the 1½-inch and 2½-inch sizes, i.e., 9 threads per inch for 1½-inch hose and 7½ threads per inch for 2½-inch hose.

(i) Firehose shall be 50 feet in length except on weather decks the hose shall be increased in length if necessary to enable a single length to be goose-necked over each side of the vessel. If two fire mains are installed on the weather decks, the length of hose shall be such that it may be goose-necked over the side from the nearest fire main.

(j) Firehose when part of the fire equipment shall not be used for any other purpose than fire extinguishing, fire drills, and testing.

(k) Firehose shall be connected to outlets at all times. However, in heavy weather on open decks where no protection is afforded the hose may be removed temporarily from the hydrant and stowed in an accessible location nearby. While in port, firehose in way of cargo area shall be kept ready for immediate use. The firehose may be temporarily removed when it will interfere with the handling of cargo.

(l) All lined and unlined hose installed after January 1, 1961, shall be of firehose quality, in conformance with Underwriters' Laboratories, Inc., Standard 18 or 19, or Federal Specification JJ-H-571 or ZZ-H-451a. Hose which bears the label of Underwriters' Laboratories, Inc., will be accepted as conforming to this requirement.

(m) Coupling shall conform to the requirements of paragraph (h) of this section.

(n) All firehose, including those in the engine and boiler spaces, shall be fitted with approved combination nozzles, each having a solid stream orifice of not less than ⅞-inch diameter for the 2½-inch size and not less than ⅝-inch diameter for the 1½-inch size. The nozzle shall be capable of producing a solid stream or a high velocity spray and of being shut off.

(o) There shall be approved low velocity spray applicators conveniently located for use as required by Table 34.10-10(o). Each shall have the proper connection for mating its adjacent combination nozzle.

Table 34.10-10(o) Low Velocity Spray Applicators

Location	Number	Length
Living spaces	1	4 or 6 feet.
Weather decks	4	10 or 12 feet.
Machinery spaces	2	4 or 6 feet.

34.10-15 Piping—T/ALL. (a) All piping, valves and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) An adequate number of valves shall be installed to isolate damaged sections of piping.

(c) All distribution valves shall be marked as required by Section 35.40-10 of this subchapter.

(d) Tankships of 1,000 gross tons and over on an international voyage shall be provided with at least one international shore connection. Facilities shall be available enabling such a connection to be used on either side of the vessel. The international shore connection shall be in accordance with specification Subpart 162.034 of Subchapter Q (Specifications) of this chapter.

(e) For tankships on an international voyage, the diameter of the fire main shall be sufficient for the effective distribution of the maximum required discharge from two fire pumps operating simultaneously. This requirement is in addition to Paragraph 34.10-5(b). The discharge of this quantity of water through hoses and nozzles at a sufficient number of adjacent hydrants shall be at a minimum Pitot tube pressure of approximately 50 pounds per square inch.

34.10-90 Installations contracted for prior to May 26, 1965—T/ALL. (a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) Except as further modified by this paragraph, the details of the systems shall be in general agreement with Sections 34.10-5 through 34.10-15 insofar as is reasonable and practicable.

(3) Tankships of less than 500 gross tons shall be equipped with an efficient hand pump capable of delivering 50 gallons per minute or a power-driven pump of equivalent capacity. However, on tankships of 20 gross tons or under where it is impracticable to install a hand or power-operated fire pump, or on tankships with only one man in the crew, at least one additional B-II fire extinguisher may be accepted in lieu of a fire pump.

(4) Tankships of 500 gross tons and over but not over 1,000 gross tons shall be provided with one independently power-driven pump.

(5) Tankships of over 1,000 gross tons shall be provided with two independently power-driven pumps.

(6) On tankships of 500 gross tons and over, the capacity of the combined fire pump installation shall be one-fifth gallon per minute per gross ton of the ship. The maximum total fire pump capacity required for any tankship shall be 800 gallons per minute.

(7) Fire pumps on tankships of 500 gross tons and over shall be capable of delivering two powerful jets of water simultaneously from the highest outlets on the fire main at a Pitot tube pressure of approximately 50 pounds per square inch through nozzles, each having an orifice of not less than ⅞-inch diameter where the internal diameter of the hose exceeds 1½ inches, and not less than ⅝-inch diameter where the internal diameter of the hose does not exceed 1½ inches.

(8) On oil-burning tankships, provided with two fire pumps, where the engine and fire rooms are not entirely separated by iron or steel bulkheads, or if fuel can drain from fireroom bilges into the engineroom, one of the fire pumps shall be located in an accessible space separate from the machinery compartment. On all tankships contracted for on or after November 19, 1952, the requirements of Paragraph (f) of Section 34.10–5 shall be met.

(9) Fire hydrant outlets shall have a minimum diameter of 1½ inches.

(10) On all tankships of 1,000 gross tons and over contracted for on or after July 1, 1951, but prior to January 1, 1962, the nozzles used on at least 2 hose lines in the boiler and machinery spaces shall be approved combination nozzles. In addition, an approved applicator equipped with a low velocity water spray tip, which is capable of being attached directly to the nozzle or the hose, shall be provided for each nozzle. Unless a self-cleaning strainer is contained within the nozzle itself and within the applicator where the applicator is attached directly to the hose, there shall be a self-cleaning strainer attached to the fire hydrant either directly or by means of a short length of hose, except where high and low velocity spray heads have large orifice openings.

(11) Firehose lines in boiler and machinery spaces of vessels of 1,000 gross tons and over, contracted for prior to July 1, 1951, shall be provided with at least 2 suitable nozzles of an approved type which are capable of effectively extinguishing oil fires. Approved combination nozzles together with the applicator and low velocity spray head, will be acceptable for this purpose. The self-cleaning strainer may be fitted, but will not be required.

(12) At least 25 percent of the hydrants, exclusive of those in the boiler and machinery spaces, shall be fitted with approved combination nozzles, applicators with low velocity spray heads, and self-cleaning strainers as described in subparagraph (10) of this paragraph. Such nozzles shall be strategically located throughout the tankship.

(13) Where approved combination nozzles are used with fire lines other than required in subparagraphs (10) through (12) of this paragraph, the applicators, low velocity spray heads, and self-cleaning strainers may be fitted, but will not be required.

(14) Vessels contracted for on or after July 1, 1954, shall meet the requirements of Paragraph 34.10–10(h).

(b) Installations contracted for on or after January 1, 1962, but prior to May 26, 1965, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory as long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with Sections 34.10–5 through 34.10–15 insofar as is reasonable and practicable.

SUBPART 34.13—STEAM SMOTHERING SYSTEM, DETAILS

34.13–1 Application—T/ALL. (a) In accordance with Section 34.05–5, steam smothering systems are not permitted on vessels contracted for on or after January 1, 1962, except as provided for under subparagraph 34.05–5(a)(2).

(b) Where a steam smothering system is already installed on a vessel contracted for prior to that date, the provisions of this subpart shall apply.

(c) This does not preclude the introduction of steam into such confined spaces as boiler casings or into tanks for steaming out purposes. Such installations are not to be considered as part of any required fire extinguishing system.

34.13–90 Installations contracted for prior to January 1, 1962—T/ALL. (a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials and facilities previously approved will be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standard as the original installation.

(2) Steam shall be available from the main or auxiliary boilers, or from a shore source. The capacity of the steam supply shall be at least equal to one pound of steam per hour for each 12 cubic feet of the largest cargo compartment in the case of installations contracted for on or after November 19, 1952, and one pound of steam per hour for each 50 cubic feet of the largest cargo compartment in the case of installations contracted for prior to November 19, 1952.

(3) Where reasonable and practicable, the steam pressure shall be at least 100 p.s.i.

(4) The piping system shall meet the general requirements of this subparagraph insofar as is reasonable and practicable.

(i) All piping, valves, and fittings shall meet the applicable requirements of subchapter F (Marine Engineering) of this chapter. All valves and manifolds shall be marked as required by Section 35.40-10.

(ii) The supply may be taken from any steam line having adequate capacity.

(iii) The distribution line to each compartment shall be fitted with a shutoff valve.

(iv) Provisions shall be made for draining the manifold and distribution lines to prevent them from freezing.

(v) The minimum size and number of branches to the various spaces shall be as given in Table 34.13-90(a)(4)(v). The distribution piping from the manifold to the branch lines shall have an area approximately equal to the combined areas of the branch lines served.

TABLE 34.13-90(a)(4)(v)

Volume of space in cubic feet		Number of branches to space	Pipe size of each branch, inches
Over—	Not over—		
----------	500	1	¾
500	5,000	1	1
5,000	15,000	1	1¼
15,000	and over	1	1½

(vi) The steam supply line to any distribution manifold shall be of sufficient size to supply all the branch lines to the largest compartment.

(vii) All controls and valves for the operation of the system shall be outside the space protected and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any places protected.

(5) For the purpose of this paragraph, the term "largest cargo compartment" shall be considered as the cargo space, either liquid or dry, having the greatest volumetric measurement. In the case of liquid cargo tanks, the gross volume of the largest tank and all adjoining tanks shall be used for installations contracted for on or after November 19, 1952; for installations contracted for prior to November 19, 1952, the gross volume of the individual tanks shall be used. In the case of dry-cargo compartments, the gross volume shall be taken between adjacent watertight or firescreen bulkheads, and from tank top or lowest deck to the deckhead of the uppermost deck on which cargo may be carried, and if a trunk extends beyond such deckhead, the volume of the trunk shall be included.

(6) The valves to the tanks shall be left open at all times so that, in case of fire, it will be necessary only to open the master valve to insure a flow of steam into each tank, after which, the valves to the tanks which are not on fire may be closed; however, where the opening of such branch lines may cause contamination of cargo or cause the passage of gases or vapors between tanks or compartments, they may be kept closed.

(7) Piping for dry-cargo spaces, pumprooms, paint and lamp lockers, and similar spaces shall be run independent of the extinguishing system for the bulk cargo tanks. If this should be impracticable, valves shall be installed between the main bulk tank extinguishing system and other compartments served, such valves to be marked: "This valve to be kept closed except in case of fire."

(8) The master valve control shall be located above the uppermost complete deck having permanent means of closing all openings in the weather portions of the deck.

(9) Control valves for pumproom extinguishment systems shall be located adjacent to the pumproom exit.

(10) In pumprooms the outlets shall terminate just above the floorplates.

SUBPART 34.15—CARBON DIOXIDE EXTINGUISHING SYSTEMS, DETAILS

34.15-1 Application—T/ALL. (a) Where a carbon dioxide extinguishing system is installed, the provisions of this subpart, with the exception of Section 34.15-90, shall apply to all installations contracted for on or after January 1, 1962. Installations contracted for prior to January 1, 1962, shall meet the requirements of Section 34.15-90.

(b) The requirements of this subpart are based on a "high pressure system," i.e., one in which the carbon dioxide is stored in liquid form at atmospheric temperature. Details for "low pressure systems," i.e., those in which the carbon dioxide is stored in liquid form at a continuously controlled low temperature, may be specifically approved by the Commandant where it is demonstrated that a comparable degree of safety and fire extinguishing ability is achieved.

34.15-5 Quantity, pipe sizes, and discharge rates—T/ALL. (a) General. (1) The amount of carbon dioxide required for each space shall be as determined by paragraphs (b) through (c) of this section.

(b) Total available supply. (1) A separate supply of carbon dioxide need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(c) Dry cargo spaces. (1) The number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space in cubic feet divided by 30.

(2) Although separate piping shall be led to each cargo hold and 'tween deck, for the purpose

of determining the amount of carbon dioxide required, a cargo compartment will be considered as the space between watertight or firescreen bulkheads and from the tank top or lowest deck to the deckhead of the uppermost space on which cargo may be carried. If a trunk extends beyond such deck, the trunk volume shall be included. Tonnage openings shall be considered as sealed for this purpose.

(3) Branch lines to the various cargo holds and 'tween decks shall not be less than ¾-inch standard pipe size.

(4) No specific discharge rate need be applied to such systems.

(d) Enclosed ventilation systems for rotating electrical propulsion equipment. (1) The number of pounds of carbon dioxide required for the initial charge shall be equal to the gross volume of the system divided by 10 for systems having a volume of less than 2,000 cubic feet, and divided by 12 for systems having a volume of 2,000 cubic feet or more.

(2) The piping for the initial charge shall be in accordance with Table 34.15–5(e)(4), and the discharge of the required amount shall be completed within 2 minutes.

(3) In addition to the above there shall be sufficient carbon dioxide available to permit delayed discharges of such quantity as to maintain at least a 25 percent concentration until the equipment can be stopped. If the initial discharge is such as to achieve this concentration until the equipment is stopped, no delayed discharge need be provided.

(4) The piping for the delayed discharge shall not be less than ½-inch standard pipe, and no specific discharge rate need be applied to such systems. On small systems, this pipe may be incorporated with the initial discharge piping.

(e) Machinery spaces, pumprooms, paint lockers, and similar spaces. (1) Except as provided in subparagraph (4) of this paragraph, the number of pounds of carbon dioxide required for each space shall be equal to the gross volume of the space divided by the appropriate factor noted in Table 34.15–5(e)(1). If fuel can drain from the compartment being protected to an adjacent compartment, or if the compartments are not entirely separate, the requirements for both compartments shall be used to determine the amount of carbon dioxide to be provided. The carbon dioxide shall be arranged to discharge into both such compartments simultaneously.

(2) For the purpose of the above requirement of this paragraph, the volume of a machinery space shall be taken as exclusive of the normal machinery casing unless the boiler, internal combustion propelling machinery, or fuel oil installations subject to the discharge pressure of the fuel oil service pump extend into such space, in which

TABLE 34.15–5(e)(1)

Gross volume of compartment, cubic feet		Factor
Over—	Not over—	
----------	500	15
500	1,600	16
1,600	4,500	18
4,500	50,000	20
50,000	----------	22

case the volume shall be taken to the top of the casing or the next material reduction in casing area whichever is lower. The terms "normal machinery casing" and "material reduction in casing area" shall be defined as follows:

(i) By "normal machinery casing" shall be meant a casing the area of which is not more than 40 percent of the maximum area of the machinery space.

(ii) By "material reduction in casing area" shall be meant a reduction to at least 40 percent of the casing area.

(3) For the purpose of the above requirements of this paragraph, the volume of a pumproom shall include the pumproom and all associated trunks up to the deck at which access from the weather is provided.

(4) For tankships on an international voyage contracted for on or after May 26, 1965, the amount of carbon dioxide required for a space containing propulsion boilers or internal combustion propulsion machinery shall be as given by subparagraphs (1) and (2) of this paragraph or by dividing the entire volume, including the casing, by a factor of 25, whichever is the larger.

(5) Branch lines in the various spaces shall be as noted in Table 34.15–5(e)(5).

TABLE 34.15–5(e)(5)

Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches	Maximum quantity of carbon dioxide required, pounds	Minimum pipe size, inches
100	½	2,500	2½
225	¾	4,450	3
300	1	7,100	3½
600	1¼	10,450	4
1,000	1½	15,000	4½
2,450	2	----------	----------

(6) Distribution piping within the space shall be proportioned from the supply line to give proper distribution to the outlets without throttling.

(7) The number, type and location of discharge outlets shall be such as to give a uniform distribution throughout the space.

(8) The total area of all discharge outlets shall not exceed 85 percent nor be less than 35 percent

of the nominal cylinder outlet area or the area of the supply pipe, whichever is smaller. The nominal cylinder outlet area in square inches shall be determined by multiplying the factor 0.0022 by the number of pounds of carbon dioxide required, except that in no case shall this outlet area be less than 0.110 square inches.

(9) The discharge of at least 85 percent of the required amount of carbon dioxide shall be complete within 2 minutes.

34.15-10 Controls—T/ALL. (a) Except as noted in Paragraph 34.15-20(b), all controls and valves for the operation of the system shall be outside the space protected, and shall not be located in any space that might be cut off or made inaccessible in the event of fire in any of the spaces protected.

(b) If the same cylinders are used to protect more than one space, a manifold with normally closed stop valves shall be used to direct the carbon dioxide into the proper space. If cylinders are used to protect only one space, a normally closed stop valve shall be installed between the cylinders and the space except for systems of the type indicated in Paragraph 34.15-5(e) which contain not more than 300 pounds of carbon dioxide.

(c) Distribution piping to the dry cargo spaces shall be controlled from not more than two stations. One of the stations controlling the system for the main machinery space shall be located as convenient as practicable to one of the main escapes from the space. All control stations and the individual valves and controls shall be marked as required by Section 35.40-10 of the subchapter.

(d) Systems of the type indicated in Paragraph 34.15-5(e) shall be actuated at each station by one control operating the valve to the space and a separate control releasing at least the required amount of carbon dioxide. These two controls shall be located in a box or other enclosure clearly identified for the particular space. Systems installed without a stop valve shall be operated by one control releasing at least the required amount of carbon dioxide.

(e) Where provisions are made for the simultaneous release of a given amount of carbon dioxide by operation of a remote control, provisions shall also be made for manual control at the cylinders. Where gas pressure from pilot cylinders is used as a means for releasing the remaining cylinders, not less than two pilot cylinders shall be used for systems consisting of more than two cylinders. Each of the pilot cylinders shall be capable of manual control at the cylinder, but the remaining cylinders need not be capable of individual manual control.

(f) Systems of the type indicated in Paragraph 34.15-5(e), which are of more than 300 pounds of carbon dioxide shall be fitted with an approved delayed discharge so arranged that the alarm will be sounded for at least 20 seconds before the carbon dioxide is released into the space. Such systems of not more than 300 pounds of carbon dioxide shall also have a similar delayed discharge, except for spaces which have a suitable horizontal escape.

(g) All distribution valves and controls shall be of an approved type. All controls shall be suitably protected.

(h) Complete but simple instructions for the operation of the system shall be located in a conspicuous place at or near the releasing control device.

(i) If the space or enclosure containing the carbon dioxide supply or controls is to be locked, a key to the space or enclosure shall be in a break-glass-type box conspicuously located adjacent to the opening.

34.15-15 Piping—T/ALL. (a) The piping, valves, and fittings shall have a bursting pressure of not less than 6,000 pounds p.s.i.

(b) All piping, in nominal sizes not over ¾-inch shall be at least Schedule 40 (standard weight) and in nominal sizes over ¾-inch, shall be at least Schedule 80 (extra heavy).

(c) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(d) A pressure relief valve or equivalent set to relieve between 2,400 and 2,800 pounds p.s.i shall be installed in the distributing manifold or such other location as to protect the piping in the event that all branch line shutoff valves are closed.

(e) All deadend lines shall extend at least 2 inches beyond the last orifice and shall be closed with cap or plug.

(f) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(g) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture. Drains and dirt traps shall be located in accessible locations where possible.

(h) Piping shall be used for no other purpose except that it may be incorporated with the fire-detecting system.

(i) Piping passing through living quarters shall not be fitted with drains or other openings within such spaces.

(j) Installation test requirements are:

(1) Upon completion of the piping installation, and before the cylinders are connected, a pressure test shall be applied as set forth in this paragraph. Only carbon dioxide or other inert gas shall be used for this test.

(2) The piping from the cylinders to the stop valves in the manifold shall be subjected to a pressure of 1,000 pounds p.s.i. with no additional gas being introduced to the system, it shall be demonstrated that the leakage of the system is such as not to permit a pressure drop of more than 150

pounds per square inch per minute for 2-minute period.

(3) The individual branch lines to the various spaces protected shall be subjected to a test similar to that described in the preceding subparagraph with the exception that the pressure used shall be 600 pounds p.s.i. in lieu of 1,000 pounds p.s.i. For the purpose of this test, the distribution piping shall be capped within the space protected at the first joint ahead of the nozzles.

(4) In lieu of the tests prescribed in the preceding subparagraphs in this paragraph, small independent systems protecting spaces such as emergency generator rooms, lamp lockers, etc., may be tested by blowing out the piping with the air at a pressure of at least 100 pounds p.s.i.

34.15-20 Carbon dioxide storage—T/ALL. (a) Except as provided in paragraph (b) of this section, the cylinders shall be located outside the spaces protected, and shall not be located in any space that might be cut off or made inaccessible in the event of a fire in any of the spaces protected.

(b) Systems of the type indicated in Paragraph 34.15-5(e), consisting of not more than 300 pounds of carbon dioxide, may have the cylinders located within the space protected. If the cylinder stowage is within the space protected, the system shall be arranged in an approved manner to be automatically operated by a heat actuator within the space in addition to the regular remote and local controls.

(c) The space containing the cylinders shall be properly ventilated and designed to preclude an anticipated ambient temperature in excess of 130 degrees F.

(d) Cylinders shall be securely fastened and supported, and where necessary, protected against injury.

(e) Cylinders shall be so mounted as to be readily accessible and capable of easy removal for recharging and inspection. Provisions shall be available for weighing the cylinders.

(f) Where subject to moisture, cylinders shall be so installed as to provide a space of at least 2 inches between the flooring and the bottom of the cylinders.

(g) Cylinders shall be mounted in an upright position or inclined not more than 30 degrees from the vertical. However, cylinders which are fitted with flexible or bent siphon tubes may be inclined not more than 80 degrees from the vertical.

(h) Where check valves are not fitted on each independent cylinder discharge, plugs or caps shall be provided for closing outlets when cylinders are removed for inspection or refilling.

(i) All cylinders used for storing carbon dioxide shall be fabricated, tested, and marked in accordance with the regulations of the Interstate Commerce Commission as noted in Section 147.04-1 of Subchapter N (Dangerous Cargoes) of this chapter.

34.15-25 Discharge outlets—T/ALL. (a) Discharge outlets shall be of an approved type.

34.15-30 Alarms—T/ALL. (a) Spaces required to have a delayed discharge by paragraph 34.15-10(f) which are protected by a carbon dioxide extinguishing system and are normally accessible to persons on board while the vessel is being navigated, other than paint and lamp lockers and similar small spaces, shall be fitted with an approved audible alarm in such spaces which will be automatically sounded before the carbon dioxide is admitted to the space. The alarm shall be conspicuously and centrally located and shall be marked as required by Section 35.40-7 of this subchapter. Such alarms shall be so arranged as to sound during the 20-second delay period prior to the discharge of carbon dioxide into the space, and the alarm shall depend on no source of power other than the carbon dioxide.

34.15-35 Enclosure openings—T/ALL. (a) Except for cargo spaces, the operation of the carbon dioxide system shall automatically shut down any mechanical ventilation to that space. This will not be required where the carbon dioxide system is a secondary system in addition to another approved primary system protecting the space.

(b) Where natural ventilation is provided for spaces protected by a carbon dioxide extinguishing system, provisions shall be made for easily and effectively closing off the ventilation.

(c) Means shall be provided for closing all other openings to the space protected from outside such space. In this respect, relatively tight doors, shutters, or dampers shall be provided for openings in the lower portion of the space. The construction shall be such that openings in the upper portion of the space can be closed off either by permanently installed means or by the use of canvas or other material which is normally carried by the vessel.

34.15-40 Pressure relief — T/ALL. (a) Where necessary, relatively tight compartments such as refrigeration spaces, paint lockers, etc., shall be provided with suitable means for relieving excessive pressure accumulating within the compartment when the carbon dioxide is injected.

34.15-90 Installations contracted for prior to January 1, 1962—T/ALL. (a) Installations contracted for prior to November 19, 1952, shall meet the requirements of this paragraph.

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with Sections 34.15-5 through 34.15-40 insofar as is reasonable and practicable, with the

exception of Subparagraphs 34.15-5(e) (1) through (3) covering spaces other than cargo spaces, which systems may be installed in accordance with subparagraphs (4) through (7) of this paragraph.

(3) For cargo tanks at least one pound of carbon dioxide shall be available for each 30 cubic feet of the largest cargo tank. The discharge of the required amount of carbon dioxide shall be complete within 5 minutes.

(4) In boilerrooms, the bilges shall be protected by a system discharging principally below the floorplates. Perforated pipe may be used in lieu of discharge nozzles for such systems. The number of pounds of carbon dioxide shall be equal to the gross volume of the boilerroom taken to the top of the boilers divided by 36. In the event of an elevated boilerroom which drains to the machinery space, the system shall be installed in the engineroom bilge and the gross volume shall be taken to the flat on which the boilers are installed.

(5) In machinery spaces where main propulsion internal combustion machinery is installed, the number of pounds of carbon dioxide required shall be equal to the gross volume of the space taken to the underside of the deck forming the hatch opening divided by 22.

(6) In miscellaneous spaces other than cargo or main machinery spaces the number of pounds of carbon dioxide required shall be equal to the gross volume of the space divided by 22.

(7) Branch lines to the various spaces other than cargo and similar spaces shall be as noted in Table 34.15-90(a)(7). This table is based on cylinders having discharge outlets and siphon tubes of ⅜-inch diameter.

TABLE 34.15-90(a)(7)

Number of cylinders		Nominal pipe size, inches
Over—	Not over—	
----------	2	½-standard.
2	4	¾-standard.
4	6	1-extra heavy.
6	12	1¼-extra heavy.
12	16	1½-extra heavy.
16	27	2-extra heavy.
27	39	2½-extra heavy.
39	60	3-extra heavy.
60	80	3½-extra heavy.
80	104	4-extra heavy.
104	165	5-extra heavy.

(b) Installations contracted for on or after November 19, 1952, but prior to January 1, 1962, shall meet the requirements of this paragraph.

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with Sections 34.15-5 through 34.15-40 insofar as is reasonable and practicable with the exception that delayed discharges need not be provided for installations made prior to July 1, 1957.

SUBPART 34.17—FIXED FOAM EXTINGUISHING SYSTEMS, DETAILS

34.17-1 Application—T/ALL. (a) Where a fixed foam extinguishing system is installed, the provisions of this Subpart with the exception of Section 34.17-90, shall apply to all installations contracted for on or after January 1, 1962.

(b) Installations contracted for prior to January 1, 1962, shall meet the requirements of Section 34.17-90.

34.17-5 Quantity of foam required—T/ALL.

(a) Area protected. (1) For machinery spaces and pumprooms, the system shall be so designed and arranged as to spread a blanket of foam over the entire tank top or bilge of the space protected. The arrangement of piping shall be such as to give a relatively uniform distribution over the entire area protected.

(2) Where an installation is made to protect an oil-fired boiler installation on a flat which is open to or can drain to the lower engineroom or other space, both the flat and the lower space shall be protected simultaneously. The flat shall be fitted with suitable coamings on all openings other than deck drains to properly restrain the oil and foam at that level. Other installations of a similar nature will be considered in a like manner.

(b) Rate of application. (1) The rate of discharge to foam outlets protecting the hazard shall be at least as set forth in this paragraph.

(2) For chemical foam systems with stored "A" and "B" solutions, a total of at least 1.6 gallons per minute of the two solutions shall be discharged for each 10 square feet of area protected.

(3) For other types of foam systems, the water rate to the dry-powder generators or air foam production equipment shall be at least 1.6 gallons per minute for each 10 square feet of area protected.

(c) Supply of foam-producing material. (1) There shall be provided a quantity of foam-producing material sufficient to operate the equipment at the minimum discharge rate specified in paragraph (b) of this section for a period of at least 3 minutes.

(d) Separate supply of foam-producing material. (1) A separate supply of foam-producing material need not be provided for each space protected. This includes a deck foam system. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) Water supply for required pumps. (1) The water supply shall be from outside and completely independent of the space protected.

34.17-10 Controls—T/ALL. (a) The foam agent, its container, measuring devices, and other items peculiar to the system shall be of an approved type.

(b) The foam-producing material container and all controls and valves for the operation of the system shall be outside the space protected and shall not be located in such space as might be cut off or made inaccessible in the event of fire in any of the spaces protected. The control space shall be as convenient as practicable to one of the main escapes from the spaces protected, and shall be marked as required by Section 35.40-10 of this subchapter. Where pumps are required, it shall not be necessary that they be started from the control space.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) The valves to the various spaces served shall be marked as required by Section 35.40-10 of this subchapter.

34.17-15 Piping—T/ALL. (a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Piping shall not be used for any other purpose than firefighting, drills and testing.

34.17-20 Discharge outlets—T/ALL. (a) Discharge outlets shall be of an approved type.

34.17-25 Additional protection required—T/ALL. (a) In order that any residual fires above the floorplates may be extinguished when a foam system is installed for the protection of machinery spaces, at least 2 fire hydrants, in addition to those required for the machinery space by Subpart 34.10, shall be installed outside of the machinery space entrance. Such hydrants shall be fitted with sufficient hose so that any part of the machinery space may be reached with at least 2 streams of water, and each hose shall be equipped with an approved combination nozzle and applicator.

34.17-90 Installations contracted for prior to January 1, 1962—T/ALL. (a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with Sections 34.17-5 through 34.17-20, insofar as is reasonable and practicable. Installations contracted for prior to November 19, 1952, need not comply with Paragraph (a)(2) of Section 34.17-5 and Section 34.17-25. A 6-inch blanket of foam in 3 minutes for machinery spaces and pumprooms will be considered as meeting the requirements of Section 34.17-5.

(3) Where a system is installed to protect a tank, it shall be so designed and arranged as to spread a blanket of foam over the entire liquid surface of the tank within the range of usual trim. The arrangement of piping shall be such as to give a relatively uniform distribution over the entire area protected.

(4) For tanks, the rate of discharge to foam outlets protecting the hazard shall be as set forth in Paragraph 34.17-5(b), except that the value of 1 gallon per minute shall be substituted in both cases for the value of 1.6 gallons per minute. The quantity of foam provided shall be sufficient to operate the equipment for 5 minutes.

(5) On installations installed prior to November 19, 1952, a semiportable foam generator using a dry-chemical mixture or mechanical foam in conjunction with the fire lines may be substituted for the fixed system subject to the following conditions:

(i) There shall be at least one fire pump of suitable capacity available which can be operated and controlled from outside the space protected.

(ii) Stop valves shall be installed in the line so that if any portion of the fire main is ruptured, the foam generator may still be operated. Connections for at least two firehoses shall be provided between the pump and the stop valve.

(iii) If the foam system is of the portable or semiportable type, the apparatus and chemicals shall be stored in a readily accessible place protected from the weather.

SUBPART 34.20—DECK FOAM SYSTEM, DETAILS

34.20-1 Application—T/ALL. (a) Where a deck foam system is installed, the provisions of this subpart, with the exception of Section 34.20-90, shall apply to all installations contracted for on or after January 1, 1962.

(b) Installations contracted for prior to January 1, 1962, shall meet the requirements of Section 34.20-90.

34.20-3 Cargo area definition—T/ALL. (a) For the purpose of this subpart, the term "cargo area" is defined as the maximum beam of the ves-

sel times the total longitudinal extent of the cargo tank spaces.

34.20-5 Quantity of foam required—T/ALL. **(a) Area protected.** Systems of this type are designed to give primary protection to the spaces over the cargo tanks.

(b) Rate of application. The water rate of the foam production equipment shall be at least 0.016 gallons per minute for each square foot of cargo area.

(c) Supply of foam-producing material. There shall be provided a supply of foam-producing material sufficient to operate the equipment at the required rate of application for a period of at least 15 minutes without recharging. If this equipment operates in excess of the required rate, the supply of foam-producing material shall be increased accordingly.

(d) Separate supply of foam-producing material. Where the same foam-producing material may be used for this system as well as a fixed foam system, separate supplies need not be provided for each space protected. The total available supply shall be at least sufficient for the space requiring the greatest amount.

(e) Water supply. Suitable pumps shall be provided capable of producing the required water rate. The fire pumps required by Subpart 34.10 may be used for this purpose; however, the operation of the deck foam system shall not interfere with the simultaneous use of the fire main system.

34.20-10 Controls—T/ALL. (a) The foam agent, its container, measuring devices, and other items peculiar to this system shall be of an approved type.

(b) The foam agent container and the main controls for operating the system shall be located in a protected space not likely to be made inaccessible in the event of a fire in any portion of the cargo area.

(c) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(d) All valves shall be marked as required by Section 35.40-17.

34.20-15 Piping—T/ALL. (a) All piping, valves, and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) All piping, valves, and fittings of ferrous materials shall be protected inside and outside against corrosion unless specifically approved otherwise by the Commandant.

(c) Piping and outlet arrangements shall be such as to permit the required rate of application to any portion of the open deck of the cargo area using the mounted and/or hand-held appliances provided. For enclosed spaces application of at least 1.6 gallons per minute water rate for each 10 square feet of the enclosed area for 5 minutes will be acceptable. For the purpose of this paragraph, it shall be assumed that all piping is damaged in way of the fire and an adequate number of valves shall be fitted for isolating damaged sections of piping.

(d) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(e) Drains and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(f) Piping shall not be used for any other purpose than firefighting, drills, and testing.

34.20-20 Discharge outlets—T/ALL. (a) Discharge outlets shall be of an approved type.

(b) Mounted and/or hand held foam appliances shall be connected to the required outlets at all times except on open decks, where the location of the outlets is such that no protection is afforded for the equipment in heavy weather.

34.20-90 Installations contracted for prior to January 1, 1962—T/ALL. (a) Installations contracted for prior to January 1, 1962, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) For installations contracted for prior to November 19, 1952, see Subparagraph 34.17-90(a)(5).

(3) Installations contracted for on or after November 4, 1957, but prior to January 1, 1962, shall meet the requirements of Sections 34.20-5 through 34.20-20 insofar as is reasonable and practicable.

SUBPART 34.25—WATER SPRAY EXTINGUISHING SYSTEMS, DETAILS

34.25-1 Application—T/ALL. (a) Where a water spray extinguishing system is installed, the provisions of this subpart, with the exception of Section 34.25-90, shall apply to all installations contracted for on or after January 1, 1964. Installations contracted for prior to January 1, 1964, shall meet the requirements of Section 34.25-90.

34.25-5 Capacity and arrangement—T/ALL. (a) The capacity and arrangement shall be such as to effectively blanket the entire area of the space protected. The rate of discharge and the arrangement of piping and spray nozzles shall be such as to give a uniform distribution over the entire area protected.

(b) The spacing of the spray nozzles shall be on the basis of the spray pattern provided by the lowest pressure at any spray nozzle in the system. In no instance shall a system be designed for any

spray nozzle to be operated at a pressure less than that for which it was approved. The maximum permissible height of the spray nozzle above the protected area shall not exceed that specified in its approval. Whenever there are obstructions to coverage by the spray patterns, additional spray nozzles shall be installed to provide full coverage.

(c) The water supply shall be from outside the space protected and shall in no way be dependent upon power from the space protected. The pump supplying water for the system shall either be reserved exclusively for the system or it may be one of the fire pumps, provided the capacity of the fire pump as set forth in Subpart 34.10 is increased by the required capacity of the system, so that this system may be operated simultaneously with the fire main system.

34.25–10 Controls—T/ALL. (a) There shall be one control valve for the operation of the system located in an accessible position outside the space protected. The control shall be located as convenient as practicable to one of the main escapes from the space protected, and shall be marked as required by Section 35.40–18 of this subchapter. It shall not be necessary to start the pumps from the control space.

(b) Complete, but simple instructions for the operation of the system shall be located in a conspicuous place at or near the controls.

(c) The valve to the space protected shall be marked as required by Section 35.40–18 of this subchapter.

34.25–15 Piping—T/ALL. (a) All piping, valves and fittings shall meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(b) Distribution piping shall be of materials resistant to corrosion, except that steel or iron pipe may be used if inside corrosion resistant coatings which will not flake off and clog the nozzles are applied. Materials readily rendered ineffective by heat of a fire shall not be used. The piping shall be subject to approval for each installation.

(c) All piping, valves, and fittings shall be securely supported, and where necessary, protected against injury.

(d) Drains, strainers, and dirt traps shall be fitted where necessary to prevent the accumulation of dirt or moisture.

(e) Threaded joints shall be metal to metal, with no thread compound used.

(f) Distribution piping shall be used for no other purpose.

(g) All piping shall be thoroughly cleaned and flushed before installation of the water spray nozzles.

34.25–20 Spray nozzles—T/ALL. (a) Spray nozzles shall be of an approved type.

34.25–90 Installations contracted for prior to January 1, 1964—T/ALL. (a) Installations contracted for prior to January 1, 1964, shall meet the following requirements:

(1) Existing arrangements, materials, and facilities previously approved shall be considered satisfactory so long as they meet the minimum requirements of this paragraph and they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. Minor repairs and alterations may be made to the same standards as the original installation.

(2) The details of the systems shall be in general agreement with Sections 34.25–5 through 34.25–20 insofar as is reasonable and practicable.

SUBPART 34.50—PORTABLE AND SEMIPORTABLE EXTINGUISHERS

34.50–1 Application — TB/ALL. (a) The provisions of this subpart, with the exception of Section 34.50–90, shall apply to all vessels contracted for on or after January 1, 1962.

(b) All vessels contracted for prior to January 1, 1962, shall meet the requirements of Section 34.50–90.

34.50–5 Classification—TB/ALL. (a) Portable and semiportable extinguishers shall be classified by a combination letter and number symbol. The letter indicating the type of fire which the unit could be expected to extinguish, and the number indicating the relative size of the unit.

(b) The types of fire will be designated as follows:

(1) "A" for fires in ordinary combustible materials such as mattresses, piles of wood, shavings, canvas, etc., where the quenching and cooling effects of quantities of water, or solutions containing large percentages of water, are of first importance.

(2) "B" for fires in combustible or flammable liquids such as gasoline, lubricating oil, diesel oil, greases, etc., where a blanketing or smothering effect is essential.

(3) "C" for fires in electrical equipment where the use of non-conducting extinguishing agent is of first importance so that electrical shock is not experienced by the firefighter.

(c) The number designations for size will start with "I" for the smallest to "V" for the largest. Extinguishers which have a gross weight of 55 pounds or less when fully charged are considered portable. Extinguishers which have a gross weight of more than 55 pounds when fully charged are considered semiportable and shall be fitted with suitable hose and nozzle or other practicable means so that all portions of the space concerned may be reached. Examples of size graduations for some of the typical portable and semiportable extinguishers are set forth in Table 34.50–5(c).

TABLE 34.50–5(c)

Classification type (*Size*)	Soda-acid and water (*Gallons*)	Foam (*Gallons*)	Carbon dioxide (*Pounds*)	Dry chemical (*Pounds*)
A–II	2½	2½		
B–I		1¼	4	2
B–II		2½	15	10
B–III		12	35	20
B–IV		20	50	30
B–V		40	[1] 100	[1] 50
C–I			4	2
C–II			15	10

[1] For outside use, double the amount shall be carried.

34.50–10 Location—TB/ALL. (a) Approved portable and semiportable extinguishers shall be installed in accordance with Table 34.50–10(a). The location of the equipment shall be such as in the opinion of the Officer in Charge, Marine Inspection, will be most convenient in case of emergency. Where special circumstances exist, not covered by Table 34.50–10(a), the Officer in Charge, Marine Inspection, may require such additional equipment as he deems necessary for the proper protection of the vessel.

TABLE 34.50–10(a)—PORTABLE AND SEMIPORTABLE EXTINGUISHERS

Tankships		Area	Tank barges	
Quantity and location	Classification (see Section 34.50–5)		Classification (see Section 34.50–5)	Quantity and location
		Safety Areas		
1 required	C–II	Wheelhouse and chartroom area		None required.
1 required in vicinity of exit	C–II [1]	Radio room		Do.
		Accommodation Areas		
1 required in each main passageway on each deck, conveniently located, and so that no room is more than 75 feet from an extinguisher.	A–II or B–II	Staterooms, toilet spaces, public spaces, offices, etc., and associated lockers, storerooms, and pantries.	A–II or B–II	1 required in vicinity of exit.
		Service Areas		
1 required for each 2,500 square feet or fraction thereof, suitable for hazard involved.	B–II or C–II	Galleys	B–II or C–II	1 required, suitable for hazard involved.
1 required for each 2,500 square feet or fraction thereof, suitable for hazard involved.	A–II or B–II	Stores areas, including paint and lamp rooms.		None required.
		Machinery Area [2]		
2 required [2]	B–II	Spaces containing oil fired boilers, either main or auxiliary, or any fuel oil units subject to the discharge pressure of the fuel oil service pump.	B–II	1 required.
1 required	and B–V [4]			
1 required for each 1,000 B.H.P., but not less than 2 nor more than 6. [4]	B–II	Spaces containing internal combustion or gas turbine propulsion machinery.		None required.
1 required [4] [7]	and B–III			
1 required in vicinity of exit. [7]	B–II	Auxiliary spaces containing internal combustion or gas turbine units.	B–II	1 required in vicinity of exit. [7] [9]
1 required in vicinity of exit [8]	C–II	Auxiliary spaces containing emergency generators.		None required.
		Cargo Areas		
1 required in lower pumproom.	B–II	Pumprooms	B–II	1 required in vicinity of exit. [9]
None required		Cargo tank area	B–II and B–V	2 required. [10] 1 required. [9] [11]

[1] Vessels not on an international voyage may substitute 2 C–I.

[2] A C–II shall be immediately available to the service generator and main switchboard areas, and further, a C–II shall be conveniently located not more than 70 feet walking distance from any point in all main machinery operating spaces. These extinguishers need *not* be in addition to other required extinguishers.

[3] Vessels of less than 1,000 gross tons require 1.

[4] Vessels of less than 1,000 gross tons may substitute 1 B–IV.

[5] Only 1 required for vessels under 65 feet in length.

[6] If oil burning donkey boiler fitted in space, the B–V previously required for the protection of the boiler may be substituted. Not required where a fixed carbon dioxide system is installed.

[7] Not required on vessels of less than 300 gross tons if fuel has a flashpoint higher than 110° F.

[8] Not required on vessels of less than 300 gross tons.

[9] Not required if fixed system installed.

[10] If no cargo pump on barge, only one B–II required.

[11] Manned barges of 100 gross tons and over only.

(b) For additional portable extinguishers as a substitute for sand, see Section 34.55–10.

(c) Semiportable extinguishers shall be located in the open so as to be readily seen.

(d) If portable extinguishers are not located in the open or behind glass so that they may be readily seen they may be placed in enclosures together with the fire hose, provided such enclosures are marked as required by Section 35.40–25 of this subchapter.

(e) Portable extinguishers and their stations shall be numbered in accordance with Section 35.40–25 of this subchapter.

(f) Hand portable or semiportable extinguishers which are required on their nameplates to be protected from freezing shall not be located where freezing temperatures may be expected.

34.50–15 Spare charges — TB/ALL. (a) Spare charges shall be carried on all vessels for at least 50 percent of each size and each variety, i.e. foam, soda-acid, carbon dioxide, etc., of portable extinguisher required by Paragraph 34.50–10(a). However, if the unit is of such variety that it cannot be readily recharged by the vessel's personnel, one spare unit of the same classification shall be carried in lieu of spare charges for all such units of the same size and variety. This section does not apply to unmanned barges.

(b) Spare charges shall be so packaged as to minimize the hazards to personnel while recharging the units.

34.50–90 Vessels contracted for prior to January 1, 1962—TB/ALL. (a) Vessels contracted for prior to January 1, 1962, shall meet the following requirements:

(1) The provisions of Sections 34.50–5 through 34.50–15 shall be met with the exception that existing installations may be maintained if in the opinion of the Officer in Charge, Marine Inspection, they are in general agreement with the degree of safety prescribed by Table 34.50–10(a). In such cases, minor modifications may be made to the same standard as the original installation: *Provided*, That in no case will a greater departure from the standards of Table 34.50–10(a) be permitted than presently exists.

SUBPART 34.55—SAND

34.55–1 Application — TB/ALL. (a) The provisions of this part shall apply to all vessels having oil fired boilers, either main or auxiliary.

34.55–5 Amount required—TB/ALL. (a) On vessels of over 1,000 gross tons there shall be in each space containing oil fired boilers a metal receptacle containing not less than 10 cubic feet of sand, sawdust impregnated with soda, or other approved dry materials, together with a scoop or shaker for distributing the same. On vessels of 1,000 gross tons or less, at least 5 cubic feet of such materials shall be similarly carried.

34.55–10 Substitute—TB/ALL. (a) An additional B–II portable extinguisher may be carried in lieu of the sand required by this part.

SUBPART 34.60—FIRE AXES

34.60–1 Application—T/ALL. (a) The provisions of this subpart shall apply to all tankships.

34.60–5 Number required—T/ALL. (a) All tankships shall carry at least the minimum number of fire axes as set forth in Table 34.60–5(a). Nothing in this paragraph shall be construed as limiting the Officer in Charge, Marine Inspection, from requiring such additional fire axes as he deems necessary for the proper protection of the tankship.

TABLE 34.60–5(a)

Gross tons		Number of axes
Over—	Not over—	
----------	50	1
50	200	2
200	500	3
500	1,000	4
1,000	----------	5

34.60–10 Location—T/ALL. (a) Fire axes shall be distributed throughout the spaces so as to be most readily available in the event of emergency.

(b) If fire axes are not located in the open, or behind glass, so that they may readily be seen, they may be placed in enclosures together with the firehose, provided such enclosures are marked as required by Section 35.40–15 of this subchapter.

PART 35—OPERATIONS

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AUTHORITY: The provisions of this Part 35 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). R.S. 4472, as amended, 4488, as amended, 4491, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 170, 481, 489, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.

SUBPART 35.01—SPECIAL OPERATING REQUIREMENTS

35.01-1 Inspection and testing required when making alterations, repairs, or other such operations involving riveting, welding, burning, or like fire-producing actions—TB/ALL. (a) The provisions of "Standard for the Control of Gas Hazards on Vessels to be Repaired," NFPA No. 306, published by National Fire Protection Association, 60 Batterymarch Street, Boston, Mass., 02110, shall be used as a guide in conducting the inspections and issuance of certificates required by this section.

(b) Until an inspection has been made to determine that such operation can be undertaken with safety, no alterations, repairs, or other such operations involving riveting, welding, burning, or like fire producing actions shall be made:

(1) Within or on the boundaries of cargo tanks which have been used to carry flammable or combustible liquid or chemicals in bulk, or within spaces adjacent to such cargo tanks; or,

(2) Within or on the boundaries of fuel tanks; or,

(3) To pipe lines, heating coils, pumps, fittings, or other appurtenances connected to such cargo or fuel tanks.

(c) Such inspections shall be made and evidenced as follows:

(1) In ports or places in the United States or its territories and possessions, the inspection shall be made by a marine chemist certificated by the National Fire Protection Association; however, if the services of such certified marine chemist are not reasonably available, the Officer in Charge, Marine Inspection, upon the recommendation of the vessel owner and his contractor or their representative, shall select a person who, in the case of an individual vessel, shall be authorized to make such inspection. If the inspection indicates that such operations can be undertaken with safety, a certificate setting forth the fact in writing and qualified as may be required, shall be issued by the certified marine chemist or the authorized person before the work is started. Such qualifications shall include any requirements as may be deemed necessary to maintain, insofar as can reasonably be done, the safe conditions in the spaces certified, throughout the operation and shall include such additional tests and certifications as considered required. Such qualifications and requirements shall include precautions necessary to eliminate or minimize hazards that may be present from protective coatings or residues from cargoes.

(2) When not in such a port or place, and a marine chemist or such person authorized by the Officer in Charge, Marine Inspection, is not reasonably available, the inspection shall be made by the senior officer present and a proper entry shall be made in the vessel's logbook.

(d) It shall be the responsibility of the senior officer present to secure copies of certificates issued by the certified marine chemist or such person authorized by the Officer in Charge, Marine Inspection. It shall be the responsibility of the senior officer present, insofar as the persons under his control are concerned, to maintain a safe condition on the vessel by full observance of all qualifications and requirements listed by the marine chemist in the certificate.

35.01-5 Sanitary condition and crew quarters—T/ALL. (a) It shall be the duty of the master and chief engineer of every tankship to see that such vessel and crew's quarters are kept in a sanitary condition.

(b) Crew quarters shall be kept in sanitary condition by daily cleaning and removal of rubbish, and by painting at regular intervals as

needed. Floors shall be maintained in good condition to facilitate cleaning. Lighting, heating, and ventilation in quarters shall be maintained in satisfactory condition: *Provided, however*, That forced ventilation when installed may be closed down during transfer of cargo.

(c) Before making any important repairs to or changes in the electrical installation, an inspection shall be made as required by Paragraph 111.05–10 (f) of Subchapter J (Electrical Engineering) of this chapter, and such changes or repairs shall (1) comply with the requirements of this Subchapter J and (2) have the approval of the chief engineer. Miscellaneous electrical appliances intended to provide additional artificial lighting, entertainment, and for personal use, etc. shall also be subject to the approval of the chief engineer.

35.01–10 Shipping papers—TB/ALL. Each loaded tank vessel shall have on board a bill of lading, manifest, or shipping document giving the name of the consignee and the location of the delivery point, the kind, grades, and approximate quantity of each kind and grade of cargo, and for whose account the cargo is being handled. The tank vessel shall not be delayed in order to secure exact quantities of cargo. Such manifests or bills of lading may be made out by the master, master of the towing vessel, owner, or agent of the owner: *Provided, however*, That in the case of unmanned barges where shipping papers are not available, an entry in the logbook of the towing vessel giving the name of the shipper and location of shipping point, the name of the consignee and location of delivery point, the approximate kind, grade, and quantity of cargo in each barge of the tow, and for whose account the cargo is being handled, shall be considered as complying with the requirements of this section.

35.01–15 Carriage of persons other than crew—TB/ALL. No person not connected with the operation of a tankship or tank barge or not having legitimate business with said vessel, shall be permitted aboard while vessel is under way unless specifically allowed by its certificate.

35.01–20 Pilot ladders—T/OC. (a) On and after May 26, 1965, every tankship which normally employs a pilot shall have an approved type ladder for the use of the pilot in addition to the ladders required by Paragraph 33.20–1(c) of this subchapter. Pilot ladder installations shall be in accordance with the following:

(1) All pilot ladders shall be approved Type I (rope suspension) or Type II (chain suspension) ladders constructed in accordance with Subpart 160.017 of Subchapter Q (Specifications) of this chapter.

(2) Suitable spreaders, a man rope, and a safety line shall be kept readily available for use in conjunction with the pilot ladder whenever circumstances may so require.

(3) When used, the ladder shall be secured in a position so that each step rests firmly against the ship's side, and so the pilot can gain safe and convenient access to the ship after climbing not more than 30 feet. Whenever the distance from sea level is more than 30 feet, access from the pilot ladder to the ship shall be by means of an accommodation ladder or other equally safe and convenient means.

(4) Arrangements shall be such that the rigging of the ladder and the embarkation and debarkation of the pilot is supervised by a responsible officer of the ship, and that handholds are provided to assist the pilot to pass safely and conveniently from the head of the ladder into the ship or onto the ship's deck.

(5) At night a light shining over the side shall be available for use, and the deck at the position where the pilot boards the ship shall be adequately lighted.

(b) Tankships contracted for prior to May 26, 1965, shall meet the requirements of this section, except as follows:

(1) Existing pilot ladders not meeting the requirements of paragraph (a)(1) of this section may be continued in service so long as they are maintained in good condition to the satisfaction of the Officer in Charge, Marine Inspection. All new or replacement ladders shall meet the applicable requirements.

35.01–25 Aluminum and/or magnesium sacrificial anode installations—TB/ALL. (a) The installation of aluminum and/or magnesium sacrificial anodes in cargo tanks utilized for the carriage of flammable or combustible liquids in bulk is prohibited.

(b) All existing installations of aluminum and/or magnesium sacrificial anodes in cargo tanks utilized for the carriage of flammable or combustible liquids in bulk shall be removed at the first available opportunity but not later than October 1, 1964.

35.01–30 Reckless or negligent operation prohibited by law—TB/ALL. (a) Subsection 13 (a) of the Act of April 25, 1940, as amended (46 U.S.C. 526*l*), reads as follows:

> No person shall operate any motorboat or any vessel in a reckless or negligent manner so as to endanger the life, limb, or property of any person. To "operate" means to navigate or otherwise use a motorboat or a vessel.

(Interpret or apply sec. 17, 54 Stat. 166, as amended; 46 U.S.C. 526p)

35.01–35 Repairs and alterations to fire-fighting equipment—TB/ALL. (a) No extensive repairs or alterations, except in emergency, shall be made to any fire-extinguishing apparatus, or other appliance subject to inspection, without advance notice to the Officer in Charge, Marine Inspection. Such repairs or alterations shall so far as is practicable be made with materials and

tested in the manner specified within the regulations in this subchapter and Subchapter Q (Specifications) of this chapter for new construction.

(b) Emergency repairs or alterations shall be reported as soon as practicable to the Officer in Charge, Marine Inspection, where the vessel may call after such repairs are made.

35.01–40 Prevention of oil pollution—TB/ALL. (a) All tank vessels shall be so operated as to meet the requirements of the Oil Pollution Act, 1924 (33 U.S.C. 431–437). In addition, all tankships shall be so operated as to avoid discharging any oil, oily ballast, or tank washings which may foul the surface of the sea, within any of the prohibited zones set forth in the Oil Pollution Act, 1961 (33 U.S.C. 1001–1015).

(Sec. 8, 75 Stat. 403; 33 U.S.C. 1007.)

35.01–45 Open hopper type barges—B/ALL. (a) With the exception of those open hopper type barges constructed or modified in conformance with the requirements of Subpart 32.63 of this subchapter, the special operating conditions in this section apply to all other open hopper type barges carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32 of this subchapter).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(b) All open hopper types barges, while carrying in bulk any of the cargoes described in paragraph (a) of this section, shall be operated in conformance with the provisions in this section. However, the provisions in this section are not applicable to such barges when empty (not necessarily cleaned or gas-freed).

(c)(1) Except as otherwise provided in this section, no such open hopper type barge shall be placed as a lead barge in any tow. Such barges shall be placed in protected positions within the tow so that the danger from diving or swamping will be minimized. Where, due to operating conditions, compliance with this subparagraph is impossible, the provisions of subparagraph (3) of this paragraph apply. The person in charge of the towing vessel shall be responsible for compliance with this subparagraph.

(2) No such open hopper type barge shall be moved from a loading facility unless all void spaces and bilges are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure the maintenance of such water-free conditions, in order to minimize the free surface effect in both the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments shall be closed and secured at all times. In the case of unmanned barges, the person in charge of the towing vessel shall be deemed to be in charge of the barge, and all requirements to be carried out on the barge shall be carried out by or under the direction of such person.

(3) When an open hopper type barge is in an exposed position, such that protection from swamping provided by adjoining barges cannot be obtained from location within the tow alone, it shall be the responsibility of the person in charge of the towing vessel to control speed so as to insure protection against diving and swamping of the barge, having due regard to its design and freeboard, and to the operating conditions.

(d) To show that special operating requirements apply to a specific open hopper type barge, additional placards or signs shall be displayed in at least four different locations on the barge when the cargoes described in paragraph (a) of this section are carried in any form in the cargo tanks. The placards or signs shall be posted on the barge approximately amidships on each side and near the centerline of each end, facing outboard. Racks, or other suitable means, for mounting such placards or signs shall be so arranged as to provide clear visibility and shall be protected from becoming readily damaged or obscured. The placards or signs shall be at least equal in dimensions to the ICC standard tank car "Dangerous" placard (10¾ inches square or larger), and shall display a circle (10 inches in diameter or larger) with alternating quadrants of white and red, and so mounted that the red quadrants are centered on the vertical axis. The shipper and/or owner of the barge shall be responsible for the installation of the required placards or signs, including maintenance of them while such barge is in temporary storage with cargo aboard. The person in charge of the towing vessel shall be responsible for the continued maintenance of the placards or signs while such barge is in transit.

35.01–50 Special operating requirements for tank barges carrying certain dangerous bulk cargoes—B/ALL. (a) The requirements of this section shall apply to all tank barges carrying bulk cargoes as follows:

(1) Flammable liquids having a Reid vapor pressure in excess of 25 pounds per square inch, absolute, in independent tanks (Part 32 of this subchapter).

(2) Liquefied flammable gases (Part 38 of this subchapter).

(3) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(4) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

(b) All tank barges constructed or modified in conformance with the requirements of Subpart 32.63 of this subchapter are exempt from the provisions of Section 35.01–45.

(c) When it is necessary to operate box or square-end barges as lead barges of tows, the person in charge of the towing vessel shall control the speed to insure protection against diving and swamping of such barges, having due regard to their design and freeboard, and to the operating conditions.

(d) All barges, while carrying in bulk any of the cargoes described in paragraph (a) of this section, shall be operated in conformance with the provisions of this section. However, the provisions of this section are not applicable to such barges when empty and gas-freed.

(e) Barges shall not be moved from a loading facility unless all bilges and void spaces (except those used for ballasting) are substantially free of water. Periodic inspections and necessary pumping shall be carried out to insure maintenance of such water-free condition in order to minimize the free surface effects, both in the longitudinal and transverse directions. Except when otherwise considered necessary for inspection or pumping, all hatch covers and other hull closure devices for void spaces and hull compartments other than cargo spaces shall be closed and secured at all times.

(f) During the time the cargo tanks contain dangerous cargoes described in paragraph (a) of this section in any amount, in the liquid or gaseous state, the barge shall be under constant surveillance.

(1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while underway.

(2) A towing vessel engaged in transporting such unmanned barges shall not leave them unattended. When a barge is moored, but not gas free, it shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other person. Such person shall be responsible for the security of the barge and for keeping unauthorized persons off the barge. Such person shall be provided with, read, and have in his possession for ready reference the information cards required by Section 35.01–55.

(g) The owner, operator, master, or person in charge of any barge carrying dangerous cargoes described in paragraph (a) of this section shall insure that, while the barge is being towed and during cargo transfer operations, the persons as required by Section 31.15–5 of this subchapter and Section 35.35–1 and information cards as required by Section 35.01–55 are provided.

35.01–55 Warning signs and information cards for those barges carrying bulk cargoes having dangerous characteristics in addition to flammability or combustibility—B/ALL. (a) The requirements of this section shall apply to all tank barges carrying bulk cargoes as follows:

(1) Liquefied flammable gases having significant hazards other than flammability (Part 38 of this subchapter).

(2) Flammable or combustible liquids having lethal characteristics (Class B or C poisons) (Part 39 of this subchapter).

(3) Certain flammable or combustible dangerous cargoes (Part 40 of this subchapter).

(b) Warning signs shall be displayed on the vessel, port and starboard, facing outboard without obstructions, at all times except when the vessel is gas free. The warning sign shall be rectangular and a minimum of three feet wide and two feet high. It shall be of sufficient size to accommodate the required alerting information, which shall be in black block style letters and numerals (characters) at least three inches high on a white background. The minimum spacing between adjacent words and lines of characters shall be two inches. The minimum spacing between adjacent characters shall be one-half inch. All characters shall have a minimum stroke width of one-half inch and shall be a minimum of two inches wide, except for the letters "M" and "W" which shall be a minimum of three inches wide, and except for the letter "I" and the numeral "1", which may be one-half inch wide. The signs shall have a two-inch minimum white border clear of characters. The signs shall be maintained legible. The alerting information shall include the following:

(1) Danger.

(2) Categories of hazards: (This shall be as listed in the classification column in Section 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter, and additional descriptive terms, as applicable).

(3) Cargo identification by name: (This name shall be as listed in Section 146.04–5 in Subchapter N (Dangerous Cargoes) of this chapter. If not specifically listed by name, the common chemical name as shown on the information card shall be used).

(4) Prohibitions: (Necessary prohibitions, such as "No Smoking," etc).

(c) An information card for each cargo being transported shall be carried on the bridge or in the pilothouse of the towing vessel readily available for use by the person in charge of the watch. Such information card shall also be carried aboard the barge when it is not gas free. The minimum card size shall be 7″ by 9½″. The card shall have legible printing on one side only. The following data shall be listed:

(1) *Cargo identification characteristics.* Identification of the cargo as listed in Section 146.04–5 in Subchapter N (Dangerous Cargoes) of this

chapter and its common chemical name if the chemical name is not so specifically listed, its appearance and odor. A statement of the hazards involved and instructions for the safe handling of the cargo and, as applicable, the need for special cargo environments.

(2) *Emergency procedures.* Precautions to be observed in the event of spills, leaks, or equipment or machinery breakdown and/or uncontrolled release of the cargo into the waterway or atmosphere. Precautions to be observed in the event of exposure of personnel to toxic cargoes.

(3) *Firefighting procedures.* Precautions to be observed in the event of a fire occurring on or in the vicinity of the barge, and an enumeration of firefighting media suitable for use in case of a cargo fire.

(d) In the event that a barge is or has been loaded with two or more dangerous cargoes described in paragraph (a) of this section and until the tanks containing such cargoes have been gas freed, the following additional requirements shall be met:

(1) A warning sign, meeting the requirements of paragraph (b) of this section and setting forth the alerting information required by paragraphs (b) (1) and (4) of this section, shall be located amidships.

(2) The warning signs, meeting the requirements of paragraph (b) of this section and setting forth the alerting information required by paragraphs (b) (2) and (3) of this section, shall be so located that each sign positively identifies the contents of each tank.

(3) An information card for each cargo (see paragraph (c) of this section) shall be carried for ready reference aboard the barge.

SUBPART 35.03—WORK VESTS

35.03–1 Application—TB/ALL. (a) Provisions of this subpart shall apply to all tank vessels.

35.03–5 Approved unicellular plastic foam work vests—TB/ALL. (a) Buoyant work vests carried under the permissive authority of this subpart shall conform to the specifications contained in Subpart 160.053 in Subchapter Q (Specifications) of this chapter.

35.03–10 Use—TB/ALL. (a) Approved buoyant work vests are considered to be items of safety apparel and may be carried aboard tank vessels to be worn by crewmembers when working near or over the water under favorable working conditions. They shall be used under the supervision and control of designated ship's officers. When carried, such vests shall not be accepted in lieu of any portion of the required number of approved life preservers and shall not be substituted for the approved life preservers required to be worn during drills and emergencies.

35.03–15 Shipboard stowage—TB/ALL. (a) The approved buoyant work vests shall be stowed separately from the regular stowage of approved life preservers.

(b) The locations for the stowage of work vests shall be such as not to be easily confused with that for approved life preservers.

35.03–20 Shipboard inspections—TB/ALL. (a) Each work vest shall be subject to examination by a marine inspector to determine its serviceability. If found to be satisfactory, it may be continued in service, but shall not be stamped by a marine inspector with a Coast Guard stamp. If a work vest is found not to be in a serviceable condition, then such work vest shall be removed from the vessel. If a work vest is beyond repair, it shall be destroyed or mutilated in the presence of a marine inspector so as to prevent its continued use as a work vest.

SUBPART 35.05—OFFICERS AND CREWS

35.05–1 Licensed officers and crews of tankships—T/ALL. No tankship of the United States shall be navigated unless she shall have in her service and on board such complement of licensed officers and crew, including certificated lifeboatmen and certificated tankermen where required by the regulations in this subchapter, separately stated, as called for in her certificate of inspection.

35.05–5 Master required on tankships—T/ALL. There shall be a duly licensed master on board every tankship of more than 150 gross tons, whenever such tankship is under way.

35.05–10 Pilot required on tankships—T/LBR. (a) No tankship shall be navigated unless she shall have in her service and on board either a licensed master or pilot as called for in her certificate of inspection.

(b) The navigation of every tankship above 150 gross tons shall be under the control of a first-class pilot, and every such pilot shall be limited in his license to the particular service for which he is adapted.

(c) A first-class pilot or a second-class pilot who has reached the age of 21 years may act as master or pilot in charge of the navigation of a tankship not exceeding 150 gross tons. A second-class pilot is authorized to act as pilot in charge of a watch on any tankship within the tonnage specified in his license.

35.05–15 Watchman for a tank vessel—TB/ALL—(a) Manned tank vessel. At least one member of the crew of a manned tank vessel shall be on board at all times except when the vessel is gas free or is moored at a dock or terminal at which watchman service is provided.

(b) Unmanned barge. (1) A strict watch of each unmanned barge in tow shall be maintained from the towing vessel while under way.

(2) When a barge is moored but not gas free, at least one of the following precautions shall be taken:

(i) The barge shall be under the observation of a watchman who may be a member of the complement of the towing vessel, or a terminal employee, or other competent person responsible for the security of the barge and for keeping unauthorized persons off the barge; or,

(ii) All cargo tank hatches shall be clearly marked in not less than 3-inch lettering, "DANGER—KEEP OUT," and in addition all hatch covers shall be closed and dogged down, or otherwise secured, by a tool-operated device, such as a length of pipe, so that no person can open the hatch by use of bare hands alone.

35.05-20 Physical condition of crew—TB/ALL. No person shall be engaged as a member of the crew on a tank vessel if he is known by the employer to be physically or mentally incapable of performing the duties assigned him.

35.05-25 Illness, alcohol, drugs—TB/ALL. (a) No person, known by the individual in charge of a tank vessel to be under the influence of liquor or other stimulant, or to be ill to such an extent as to unfit him for any particular service on the tank vessel, shall be allowed to perform such service while in such condition.

(b) When a member of the crew of a tank vessel which is loading bulk cargo of Grade A, B, or C arrives at the gangway and is observed to be in an intoxicated condition, he shall not be permitted to board the vessel without escort.

SUBPART 35.07—LOGBOOK ENTRIES

35.07-1 Application—TB/ALL. (a) Except as specifically noted, the provisions of this subpart shall apply to all tank vessels.

35.07-5 Logbooks and records—TB/ALL. (a) General.—TB/ALL. Under various statutes or by regulations in this subchapter, specified tank vessels shall have certain logbooks or records, and, when the occasion arises, it is the duty of the master or person in charge to place therein specific entries as required by law or regulations in this subchapter.

(b) Official Logbook—TB/OC. R.S. 4290, as amended (46 U.S.C. 201), states: "Every vessel making voyages from a port in the United States to any foreign port, or, being of the burden of 75 tons or upward, from a port on the Atlantic to a port on the Pacific, or vice versa, shall have an Official Logbook; * * *." This Official Logbook is furnished gratuitously to masters of United States' flag vessels by the Coast Guard, as Form CG-706B or CG-706C, depending upon the number of persons employed as crew. There is printed in the first several pages of this Official Logbook various acts of Congress relating to logbooks and the entries required to be made therein. When a voyage is completed, or after a specified period of time is completed, the Official Logbooks with required entries therein shall be filed with the Officer in Charge, Marine Inspection, at or nearest the port where the vessel may be.

(c) Logs or records—TB/ALL. For vessels other than those required to have Official Logbooks by R.S. 4290, the owners, operators, and/or masters are to supply their own logs or records in any form desired, which will be considered to take the place of the Official Logbooks and may be used for the purpose of making entries therein as required by law or regulations in this subchapter. Such logs or records are not filed with the Officer in Charge, Marine Inspection, but shall be kept available for review by a marine inspector for a period of one year after the date to which the records refer, except for separate records of tests and inspections of firefighting equipment which shall be maintained with the vessel's logs for the period of validity of the vessel's certificate of inspection.

35.07-10 Actions required to be logged—TB/ALL. (a) General—TB/ALL. The actions and observations noted in this section shall be entered in the Official Logbook or in logs or records considered to take place of the Official Logbooks. This section contains no requirements which are not made in specific laws or in other regulations in this subchapter, the items being merely grouped together for convenience.

(b) Entries—T/ALL. Entries shall be made in the logs of tankships with respect to the following:

(1) Fire and lifeboat drills. Weekly. See Section 35.10-5.

(2) Electric power-operated lifeboat winches. Once in each three months. See Section 35.10-7.

(3) Draft and load line marks. For tankships of 150 gross tons and over, prior to leaving port for ocean, coastwise, and Great Lakes voyages only. See 46 U.S. Code, sections 85e and 88e, and Section 35.20-5.

(4) Steering gear tests. Prior to departure, or for tankships on voyages of less than 48 hours duration or tankships operating on lakes, bays, sounds and rivers, once every week. See Section 35.20-10.

(5) Fuel oil data. Upon receipt of fuel oil on board to be used as fuel. See Section 35.25-10.

(6) Line-throwing appliances. Once every three months. See Paragraph 35.10-1(c).

(7) Inspections and tests of firefighting equipment. Once every year. See Section 31.10-18 of this subchapter.

(8) Operation and inspection of the emergency lighting and power systems. Once in each week that the vessel is navigated. See Section 35.10-15.

(9) Cargo gear inspections: At least once a month. See Section 31.37-70 of this subchapter.

(c) Entries—B/ALL. Entries shall be made in the records for tank barges with respect to the following:

(1) Inspections and tests of firefighting equipment. Once every year. See Section 31.10–18 of this subchapter.

(2) Draft and load line marks. For tank barges of 150 gross tons and over, prior to leaving port for ocean, coastwise, and Great Lakes voyages only. See 46 U.S. Code, sections 85e and 88e.

(3) Cargo gear inspections: At least once a month. See Section 31.37–70 of this subchapter.

35.07–15 Official log entries—TB/OC. (a) On vessels where an Official Logbook is required by R.S. 4290 (46 U.S.C. 201), all items relative to the crew and passengers, as well as with respect to any casualties which may occur, shall be entered in the Official Logbook as required by this law.

SUBPART 35.10—FIRE AND EMERGENCY REQUIREMENTS

35.10–1 Station bills, muster lists, and line-throwing appliance drills—T/ALL. (a) It shall be the duty of the master of every tankship over 500 gross tons to cause station bills and muster lists to be prepared before the vessel sails, which shall be signed by the master, who shall be responsible for their preparation. The station bills and muster lists shall be posted in conspicuous places in several parts of the tankship, particularly in the crew's quarters, and must contain full particulars of the signals which will be used for calling the crew to their stations for emergency duties. Special duties shall be allotted to each member of the crew and the muster list shall show all these special duties and indicate the station to which each man must go and the duties he has to perform. The special duties should, as far as possible, be comparable to the regular work of the individual.

(b) The duties provided for by the muster lists should include:

(1) The closing of airports, watertight doors, fire doors, and firescreens, the covers and all valves of all scuppers, sanitary and other discharges which lead through the ship's hull below the margin line, and stopping the fans and ventilating systems.

(2) The extinction of fire.

(3) The equipment of lifeboats, liferafts, and buoyant apparatus and their preparation for launching.

(c) The master of a tankship equipped with a line-carrying gun shall drill his crew in its use every 3 months, but the actual firing of the gun on the tankship shall be discretionary with the master. Each drill shall be recorded in the ship's logbook.

35.10–3 Display of plans—TB/ALL. (a) All self-propelled vessels of more than 100 gross tons and all barges of more than 100 gross tons with sleeping accommodations for more than six persons shall have permanently exhibited for the guidance of the officer in charge of the vessel, general arrangement plans showing for each deck the various fire retardant bulkheads together with particulars of the fire detecting, manual alarm and fire extinguishing systems, fire doors, means of ingress to the different compartments, and the ventilating systems including the positions of the dampers, the location of the remote means of stopping the fans, and the identification of the fans serving each section.

35.10–5 Emergency signals; fire and lifeboat drills—T/ALL. (a) The fire-alarm signals shall be a continuous blast of the whistle for a period of not less than 10 seconds supplemented by a continuous ringing of the general alarm bells for not less than 10 seconds. For dismissal from fire-alarm stations, the general alarm bells should be sounded three times, supplemented by three short blasts of the whistle. The signal for lifeboat drill or lifeboat stations shall be more than six short blasts and one long blast of the whistle, supplemented by the same signal on the general alarm bells. Where whistle signals are used to direct the handling of lifeboats they shall be as follows:

(1) To lower lifeboats, one short blast of the whistle.

(2) To stop lowering the lifeboats, two short blasts of the whistle.

(3) For dismissal from lifeboat stations, three short blasts of the whistle: *Provided*, That on river tankships the whistle signals specified herein may be made on the ship's bell.

(b) The master of any tankship may establish such other emergency signal, in addition to the above, as will provide that all the officers and all the crew of the tankship will have positive and certain notice of the existing emergency.

(c) The master may organize a squad to be used for emergency duties (other than a general emergency), or crew practices, and the nature of the signals or other means for assembling the squad remains within the discretion of the master. Such signals should not conflict with the navigational signals or the signals used for a general alarm.

(d) It shall be the duty of the Master, or the mate, or officer next in command to conduct a fire and boat drill at least once in every week. At least one such fire and boat drill shall be held within 24 hours of leaving a port if more than 25 percent of the crew have been replaced at that port. In connection with these drills it shall be the duty of such officer to call all hands to quarters and (weather permitting) exercise them in the unlashing and swinging out of the lifeboats, the closing

of all hand or power operated watertight doors which are in use at sea, closing all fire doors and firescreens, the use of fire pumps, and all other apparatus for the safety of life on board of such vessels with special regard for the drill of the crew in the method of adjusting life preservers; to see that all the equipments required by law are in complete working order for immediate use; and to see that lifeboat equipment is examined at least monthly to insure that it is complete. The fact of exercise of the crew as herein contemplated, shall be entered upon the ship's logbook.

(e) This section relating to fire and lifeboat drills contemplates that such drills shall be conducted precisely as though an emergency existed. To accomplish the purpose of this section, lifeboat covers and strongbacks shall be removed, plugs or caps put in place, boat ladders secured in position for use, painters carried forward and tended so as to provide a good lead and slack to hold the boat in position under the davits when in the water. Different groups of lifeboats shall be used in turn at successive boat drills and, if practicable and reasonable, every lifeboat shall be lowered at least once every three months. The person in charge of each lifeboat or liferaft should have a list of its crew and should see that the men under his orders are acquainted with their several duties. The motor and the hand-operated propeller gear of each lifeboat shall be operated for a period of not less than 5 minutes once at least in every 7 days, in order that it may be ready for service at any time. Such operation shall be made a part of the report of such drill. The hand pumps and fire pump shall be operated long enough and a sufficient number of outlets used to insure that such equipment is in order and effectual. When oxygen-breathing apparatus, gas masks, or other special equipment is carried, certain members of the crew shall be trained in the use of the equipment.

(f) The entries in the ship's logbook relating to the exercise of the crew in fire and lifeboat drills shall state the day of the month and the hour when so exercised, length of time of the drill, numbers on the lifeboats swung out and numbers on those lowered, number of lengths of firehose used, a statement of the condition of all fire and lifesaving apparatus, and a report of the monthly examination of the lifeboat equipment. If in any week the required fire and boat drills are not held or only partial drills are held, an entry shall be made stating the circumstances and extent of the drills held.

(g) Any neglect or omission on the part of the officer in command of such vessels to strictly enforce the provisions of this section shall be deemed cause for proceedings under the provisions of R.S. 4450, as amended (46 U.S.C. 239), looking to a suspension or revocation of the license of such officer.

(h) It shall be the duty of the master to require the officers and crew of all tankships to perform the aforesaid drills and discipline in the presence of marine inspectors at intervals sufficiently frequent to assure the said inspectors, by actual observance, that the foregoing requirements of this section are complied with by the officers and the crew.

(i) A copy of these requirements (Form CG–809) shall be furnished to each tankship to which this subpart applies. This form shall be framed under glass and posted in a conspicuous place.

35.10–7 Electric power-operated lifeboat winches—T/ALL. (a) It shall be the duty of the master to see that all lifeboat winch control apparatus, including motor controllers, emergency switches, master switches, and limit switches, are examined at least once in each 3 months. The examination shall include the removal of drain plugs and/or the opening of drain valves in such appliances to assure that the enclosures are free of water.

(b) The date of the examination required by this section and the condition of the equipment shall be noted in the Official Logbook.

35.10–9 Posting placards containing instructions for launching and inflating inflatable liferafts—TB/ALL. (a) Every vessel equipped with inflatable liferafts shall have posted in conspicuous places which are regularly accessible to the crew and/or passengers, approved placards containing instructions for launching and inflating inflatable liferafts for the information of persons on board. The number and location of such placards for a particular vessel shall be as determined necessary by the Officer in Charge, Marine Inspection.

(b) Under the requirements contained in Subdivision 160.051–6(c)(1) of Subpart 160.051 in Subchapter Q (Specifications) of this chapter, the manufacturer of approved inflatable liferafts is required to provide approved placards containing such instructions with each liferaft.

35.10–15 Emergency lighting and power systems—T/ALL. (a) Where fitted, it shall be the duty of the master to see that the emergency lighting and power systems are tested and inspected at least once in each week that the vessel is navigated to be assured that the system is in proper operating condition.

(b) Internal combustion engine driven emergency generators shall be tested under load for at least 2 hours, at least once in each month that the vessel is navigated.

(c) Storage batteries for emergency lighting and power systems shall be tested at least once in each 6-month period that the vessel is navigated to demonstrate the ability of the storage battery to supply the emergency loads for 6 hours.

(d) The date of the tests required by this section and the condition and performance of the

apparatus shall be noted in the vessel's Official Logbook or in logs or records considered to take the place of the Official Logbook.

35.10-20 Radio apparatus for lifeboats—T/OC. (a) It shall be the duty of the master to require that all batteries for all fixed and portable radio apparatus for lifeboats are brought up to full charge weekly if the batteries are of a type which require recharging.

(b) In any case, the transmitter shall be tested weekly using a suitable artificial aerial.

SUBPART 35.12—PLACARD OF LIFESAVING SIGNALS AND BREECHES BUOY INSTRUCTIONS

35.12-1 Application—T/OCLB. (a) The provisions of this subpart shall apply to all vessels on an international voyage, and all other vessels of 150 gross tons or over in ocean, coastwise or Great Lakes service.

35.12-5 Availability—T/OCLB. (a) On all vessels to which this subpart applies there shall be posted in the pilothouse and readily available to the deck officer of the watch a placard (Form CG-811) containing instructions for the use of breeches buoys and the lifesaving signals set forth in Regulation 16, Chapter V, of the International Convention for Safety of Life at Sea, 1960. These signals shall be used by vessels or persons in distress when communicating with lifesaving stations and maritime rescue units.

(b) A copy of Form CG-811 shall also be conveniently posted in the engineroom and crews quarters of all vessels to which this subpart applies.

SUBPART 35.15—CASUALTY OR ACCIDENT REPORTS

35.15-1 Notice of casualty and voyage records—TB/ALL. (a) The owner, agent, master, or person in charge of a vessel involved in a marine casualty shall give notice as soon as possible to the nearest marine inspection office of the United States Coast Guard whenever the casualty results in any of the following:

(1) Damage to property in excess of $1,500.00.

(2) Material damage affecting the seaworthiness or efficiency of a vessel.

(3) Stranding or grounding.

(4) Loss of life.

(5) Injury causing any person to remain incapacitated for a period in excess of 72 hours; except injury to harbor workers not resulting in death and not resulting from vessel casualty or vessel equipment casualty.

(b) The notice required by paragraph (a) of this section shall show the name and official number of the vessel involved, the owner or agent thereof, the nature and probable occasion of the casualty, the locality in which it occurred, the nature and extent of injury to persons and the damage to property.

(c) In addition to the notice required by paragraph (a) of this section, the person in charge of the vessel shall, as soon as possible, report in writing and in person to the Officer in Charge, Marine Inspection, at the port in which the casualty occurred or nearest the port of first arrival: *Provided*, That when from distance it may be inconvenient to report in person it may be done in writing only. The written report required for personal accident shall be made on Form CG-924E and submitted for each individual injured and each loss of life. For all other vessel casualties the written report shall be made on Form CG-2692.

NOTE: If filed without delay, the Form CG-924E or CG-2692 may also provide the notice required by paragraph (a) of this section.

(d) The owner, agent, master, or other person in charge of any vessel involved in a marine casualty shall retain such voyage records of the vessel as are maintained by the vessel, such as both rough and smooth deck and engineroom logs, bell books, navigation charts, navigation work books, compass deviation cards, gyrocompass records, stowage plans, record of draft, aids to mariners, radiograms sent and received, the radio log and crew and passenger lists. The owner, agent, master, or other officer in charge, shall make those records available to a duly authorized Coast Guard officer or employee for examination upon request.

(e) Whenever a vessel collides with a lightship, buoy, or other aid to navigation under the jurisdiction of the Coast Guard, or is connected with any such collision, it shall be the duty of the person in charge of such vessel to report the accident to the nearest Officer in Charge, Marine Inspection. No report on Form CG-2692 is required unless one or more of the results listed in Paragraph (a) of this section occurs.

(f) The master of any nuclear vessel shall immediately inform the Commandant in the event of any accident or casualty to the nuclear vessel which may lead to an environmental hazard. The master shall also immediately inform the competent governmental authority of the country in whose waters the vessel may be in, or whose waters the vessel approaches in a damaged condition.

(Interpret or apply R.S. 4450, as amended, secs. 1, 2, 49 Stat. 1544, secs. 13, 17, 54 Stat. 166, as amended, sec. 10, 18 Stat. 128, as amended; 46 U.S.C. 239, 367, 526L(e), 526p, 33 U.S.C. 361)

35.15-5 Reports by engineers of accidents involving boilers or machinery—T/ALL. It shall be the duty of the engineer in charge when an accident occurs to the boilers or machinery tending to render the further use of such boilers and machinery unsafe until repairs are made to report the same to the Officer in Charge, Marine Inspection, at the port in which the accident occurred or nearest the port of first arrival, immediately

upon the arrival of the tankship at the first port reached subsequent to the accident.

35.15-10 Reports when a state of war exists—T/ALL. During the period when a state of war exists between the United States and any foreign nation, communications in regard to casualties or accidents shall be handled with caution and the reports shall not be made by radio or by telegram.

SUBPART 35.20—NAVIGATION

35.20-1 Notice to mariners; aids to navigation—T/OCLB. (a) Licensed officers are required to acquaint themselves with the latest information published by the Coast Guard and the U.S. Navy regarding aids to navigation, and neglect to do so is evidence of neglect of duty. It is desirable that vessels navigating oceans and coastwise and Great Lakes waters shall have available in the pilothouse for convenient reference at all times a file of the applicable Notice to Mariners.

(b) Weekly Notices to Mariners (Great Lakes Edition), published by the Commander, 9th Coast Guard District, contain announcements and information on changes in aids to navigation and other marine information affecting the safety of navigation on the Great Lakes. These notices may be obtained free of charge, by making application to Commander, 9th Coast Guard District.

(c) Weekly Notices to Mariners (worldwide coverage) are prepared jointly by the U.S. Naval Oceanographic Office, the U.S. Coast and Geodetic Survey and the U.S. Coast Guard. They include changes in aids to navigation in assembled form for the 1st, 3d, 5th, 7th, Greater Antilles Section, 8th, 11th, 12th, 13th, 14th, and 17th Coast Guard Districts. Foreign marine information is also included in these notices. These notices are available without charge from the U.S. Naval Oceanographic Office, Washington, D.C. 20390, Branch Oceanographic Offices, U.S. Collector of Customs of the major seaports in the United States and are also on file in the U.S. Consulates where they may be inspected.

(d) All vessels shall have charts of the waters on which they operate for convenient reference at all times.

35.20-5 Draft of tankships—T/OC. The master of every tankship shall, whenever leaving port, enter the maximum draft of his vessel in the logbook.

35.20-10 Steering gear test—T/ALL. On all tankships making voyages of more than 48 hours' duration, the entire steering gear, the whistle, the means of communication, and the signaling appliances between the bridge or pilothouse and engineroom shall be examined and tested by a licensed officer of the vessel within a period of not more than 12 hours before leaving port. All such vessels making voyages of less than 48 hours' duration or operating on lakes, bays, sounds, and rivers shall be so examined and tested at least once in every week. The fact and time of such examination and test shall be recorded in the ship's logbook.

35.20-15 Steering orders — TB/ALL. (a) For all tank vessels fitted with rudders, the following steering orders shall be given in the direct sense as follows:

(1) "Right rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the right.

(2) "Left rudder" shall be given only when it is intended that the wheel, the rudder blade, and the head of the ship should go to the left.

(b) Where rudder indicators are provided, they shall be installed consistent with the requirements in paragraph (a) of this section.

35.20-20 Master's and officer's responsibility—TB/ALL. Nothing in this part shall exonerate any master or officer in command from the consequences of any neglect to keep a proper lookout or the neglect of any precaution which may be required by the ordinary practice of seamen or by the special circumstances of the case.

35.20-25 Unauthorized lights—T/ALL. Any master or pilot of any vessel who shall authorize or permit the carrying of any light, electric or otherwise, not required by law that in any way will interfere with distinguishing the signal lights may be proceeded against in accordance with the provisions of R. S. 4450 (46 U. S. C. 239), as amended, looking to a revocation or suspension of his license.

35.20-30 Flashing the rays of a searchlight or other blinding light—T/ALL. Flashing the rays of a searchlight or other blinding light onto the bridge or into the pilothouse of any vessel under way is prohibited. Any person who shall flash or cause to be flashed the rays of a blinding light in violation of the above may be proceeded against in accordance with the provision of R. S. 4450, as amended (46 U.S.C. 239), looking to the revocation or suspension of his license or certificate.

35.20-35 Whistling — T/ALL. Unnecessary sounding of vessel's whistle is prohibited within any harbor limits of the United States. Whenever any licensed officer in charge of any tankship shall authorize or permit such unnecessary whistling, such officer may be proceeded against in accordance with the provisions of R.S. 4450, as amended (46 U.S.C. 239), looking to a revocation or suspension of his license.

SUBPART 35.25—ENGINE DEPARTMENT

35.25-1 Examination of boilers and machinery by engineer—T/ALL. It shall be the duty of an engineer when he assumes charge of the boilers and machinery of a vessel to examine the same

forthwith and thoroughly. If he finds any part thereof in bad condition, he shall immediately report the facts to the master, owner, or agent, and to the nearest Officer in Charge, Marine Inspection, who shall thereupon investigate the matter, and if the former engineer has been willfully negligent in the performance of his duties, he may be proceeded against under the provisions of R. S. 4450, as amended (46 U.S.C. 239), looking to a suspension or revocation of his license.

35.25-5 Repairs of boilers and unfired pressure vessels and reports of repairs or accidents by chief engineer—TB/ALL. (a) Before making any repairs to boilers or unfired pressure vessels, the chief engineer shall submit a report covering the nature of the repairs to the Officer in Charge, Marine Inspection, at or nearest to the port where the repairs are to be made.

(b) In the event of an accident to a boiler, unfired pressure vessel, or machinery tending to render the further use of the item itself unsafe until repairs are made, or if by ordinary wear such items become unsafe, a report shall be made by the chief engineer immediately to the Officer in Charge, Marine Inspection, or if at sea, immediately upon arrival at port.

35.25-10 Requirements for fuel oil—T/ALL. (a) Oil to be used as fuel to be burned under boilers on tankships shall have a flashpoint of not less than 150° F. (Pensky-Martens Closed Cup Method, ASTM D 93).

(b) It shall be the duty of the chief engineer to make an entry in the log of each supply of fuel oil received on board, stating the quantity received, the name of the vendor, the name of the oil producer, and the flashpoint (Pensky-Martens Closed Cup Method, ASTM D 93) for which it is certified by the producer.

(c) It shall be the further duty of the chief engineer to draw and seal at the time the supply is received on board, a half-pint sample of each lot of fuel oil, such sample to be preserved until that particular supply of oil is exhausted.

35.25-15 Carrying of excess steam—TB/ALL. It shall be the duty of the chief engineer of any tank vessel to see that a steam pressure is not carried in excess of that allowed by the certificate of inspection, and to see that the safety valves, once set and sealed by the inspector are in no way tampered with or made inoperative except as provided in Section 35.25-20.

35.25-20 Breaking of safety valve seal—TB/ALL. If at any time it is necessary to break the seal on a safety valve for any purpose, the chief engineer shall advise the Officer in Charge, Marine Inspection, at the next port of call, giving the reason for breaking the seal and requesting that the valve be examined and adjusted by a marine inspector.

SUBPART 35.30—GENERAL SAFETY RULES

35.30-1 Warning signals and signs—TB/ALL—(a) Red warning signals. During transfer of bulk cargo while fast to a dock, a red signal (flag by day and electric lantern at night) shall be so placed that it will be visible on all sides. While transferring bulk cargo at anchor, a red flag only shall be displayed.

(b) Warning sign at gangway. (1) Warning placards should be kept at hand for display while a vessel is fast to a dock during transfer of cargo, to warn persons approaching the gangway. The placard shall state in letters not less than 2 inches high substantially as follows:

WARNING

No open lights.
No smoking.
No visitors.

(2) Where poisonous cargoes are being transferred the warning sign shall also include the word "Poison" to indicate the nature of the liquid being handled. (See Part 39 of this subchapter.)

(c) Warning sign in radio room. A sign shall be placed in radio room warning against the use of radio equipment during transfer of Grade A, B, or C liquids, except by permission of senior deck officer.

(d) Additional warning signs required by cargoes having significant hazards other than flammability or combustibility are described in Section 35.01-55.

(e) Additional placards or signs required in connection with the movement of certain open hopper type barges are described in Section 35.01-45.

35.30-5 Fires, matches, and smoking—TB/ALL—(a) General. In making the determinations required under paragraphs (b), (c), and (d) of this section the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall exercise his skill and experience with due regard to attendant conditions and circumstances, including consideration for location of shore side facilities, maintenance of mobility, provision for fire protection, state or change of winds, tides, sea, weather conditions, forces of nature and other circumstances generally beyond human control.

(b) Boiler fires. Boiler fires are normally permitted during cargo transfer operations: *Provided*, That prior to loading Grades A, B, and C cargoes, the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall make an inspection to determine whether in his judgment boiler fires may be maintained with reasonable safety during the loading operation.

(c) Galley fires. Galley fires are normally permitted during cargo transfer operations: *Provided*, That prior to loading Grades A, B, and C

cargoes the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall make an inspection to determine whether in his judgment galley fires may be maintained with reasonable safety during the loading operation.

(d) Smoking. Smoking is prohibited on the weather decks of tank vessels when they are not gas free or are alongside docks. At other times and places the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall designate when and where the crew may smoke: *Provided*. That prior to loading Grade A, B, or C cargo the master or senior deck officer on duty shall make an inspection to determine if and where, in his judgment. smoking may be permitted with reasonable safety during the loading operation.

(e) Matches. The use of other than safety matches is forbidden aboard tank vessels at all times.

35.30–10 Cargo tank hatches, ullage holes, and Butterworth plates—TB/ALL. No cargo tank hatches, ullage holes, or Butterworth plates shall be opened or shall remain open without flame screens, except under the supervision of the senior members of the crew on duty, unless the tank opened is gas free.

35.30–15 Combustible gas indicator—TB/ALL. (a) The provisions of this section shall apply only to United States flag vessels.

(b) Manned tank barges and tankships authorized to carry Grade A, B, C, or D liquids at any temperature, or Grade E liquids at elevated temperatures, shall be provided with a combustible gas indicator suitable for determining the presence of explosive concentrations of the cargo carried. An indicator which bears the label of Underwriters' Laboratories, Inc., Factory Mutual Engineering Division, or other organizations acceptable to the Commandant will be accepted as meeting this requirement.

35.30–20 Emergency equipment—TB/ALL. (a) All manned tank vessels having tanks which exceed 15 feet in depth, measured from the deck to the lowest point at which cargo is carried, all tankships on an international voyage, and all tankships of 1,000 gross tons and over shall be provided with an outfit as follows:

(1) One approved fresh air breathing apparatus, including belt and lifeline. The length of the airhose shall be sufficient to reach from the open deck, well clear of hatch or doorway, to any part of the holds, tanks, and, except as provided in the following subparagraph, the machinery spaces.

(2) If it is not practicable to reach all portions of the machinery space with the airhose of the fresh air breathing apparatus, an approved self-contained breathing apparatus with adequate lifeline shall be carried for use in the machinery space. In such case, the particular apparatus provided for the machinery space shall be used for no other purpose, shall be marked indicating the restriction to its use, and shall be stowed convenient to, but outside of the machinery space.

(3) One approved 3-cell, explosion-proof flashlight, constructed in accordance with Subpart 161.008 of Subchapter Q (Specifications) of this chapter.

(4) One fire ax.

(b) Approved self-contained breathing apparatus with adequate lifelines may be provided in addition to the equipment required in the preceding paragraph, and may be used in any space on the vessel.

(c) For tankships on an international voyage, lifelines shall be of steel or bronze wire rope. Steel wire rope shall be either inherently corrosion resistant or made so by galvanizing or tinning. Each end shall be fitted with a hook with keeper having a throat opening which can be readily slipped over a ⅝-inch bolt. The total length of the lifeline shall be dependent upon the size and arrangement of the vessel, and more than one line may be hooked together to achieve the necessary length. No individual length of lifeline may be less than 50 feet in length. The assembled lifeline shall have a minimum breaking strength of 1,500 pounds.

35.30–25 Explosives—TB/ALL. Fulminates or other detonating compounds in bulk in dry condition; explosive compositions that ignite spontaneously or undergo marked decomposition when subjected for forty-eight consecutive hours to a temperature of 167° F. or more; compositions containing an ammonium salt and a chlorate; and other like explosives shall not be accepted, stored, stowed or transported on board tank vessels.

35.30–30 Portable electrical equipment—TB/ALL. Illumination may be obtained in any compartment by the use of approved explosion-proof, self-contained, battery-fed lamps. Otherwise, no portable electrical equipment of any type shall be used in bulk cargo tanks, fuel oil tanks, cargo pumprooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(a) The compartment itself is gas-free;

(b) The compartments adjacent and the compartments diagonally adjacent are either (1) gas-free, (2) inerted, (3) filled with water, (4) contain Grade E liquid and are closed and secured, or (5) are spaces in which flammable vapors and gases normally are not expected to accumulate; and

(c) All other compartments of the vessel in which flammable vapors and gases may normally be expected to accumulate are closed and secured.

35.30–35 Spark producing devices—TB/ALL. (a) Where Grades A, B, C, and D liquid

cargoes are involved, power driven or manually operated spark producing devices shall not be used in bulk cargo tanks, fuel oil tanks, cargo pumprooms, or enclosed spaces immediately above or adjacent to bulk cargo tanks unless all the following conditions are met:

(1) The compartment itself is gas-free;

(2) The compartments adjacent and the compartments diagonally adjacent are either (i) gas-free, (ii) inerted, (iii) filled with water, (iv) contain Grade E liquid and are closed and secured, or (v) are spaces in which flammable vapors and gases normally are not expected to accumulate; and,

(3) All other compartments of the vessel in which flammable vapors and gases may normally be expected to accumulate are closed and secured.

(b) This section does not prohibit the use of small hand tools in such locations.

35.30–40 Flammable liquid and gas fuels as ship's stores—TB/ALL. (a) Flammable liquids and gases to be used as fuels for industrial trucks, lifeboats and other approved equipment shall be marked, labeled and stowed as follows:

(1) They shall be stowed in ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory, which containers are authorized for the contents.

(2) Containers shall be marked with the name of contents and shall be labeled in accordance with ICC requirements as follows:

(i) Flammable liquids—"Red Label"; or,

(ii) Flammable gases—"Red Gas label".

(3) Containers shall be stowed on or above the weather deck in locations designated by the master. ICC specification containers, A.S.M.E. containers, or portable safety containers having the approval of a recognized testing laboratory may be stowed below the weather deck in a paint or lamp locker provided such containers do not exceed 5 gallons capacity each.

(b) Diesel fuel shall be stowed in locations designated by the master.

35.30–45 Motion picture film—TB/ALL. (a) Only acetate or slow-burning film may be used. Nitrocellulose film is specifically prohibited.

SUBPART 35.35—CARGO HANDLING

35.35–1 Men on duty—TB/ALL. (a) A sufficient number of the crew shall be on duty to perform cargo transfer operations.

(b) In the case of unmanned barges, the owners, masters or persons in charge of such barges shall insure that a person holding a valid license as master, mate, pilot, or engineer, or a certificated tankerman is on duty to perform transfer operations, which licensed person or certificated tankerman shall be considered as the person in charge of the unmanned tank barge. Where the bulk liquid cargo to be transferred is covered by the requirements of Section 35.01–55, the Officer in Charge, Marine Inspection, shall be furnished satisfactory documentary evidence that such person is trained in, and capable of performing competently, the necessary operations which relate to the transfer of such cargo.

35.35–5 Electric bonding—TB/ALL. A tank vessel may be electrically connected to the shore piping, through which the cargo is to be transferred, prior to the connecting of a cargo hose. This electrical connection, if made, shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

35.35–10 Closing of scuppers and sea valves—TB/ALL. Deck officer in charge shall see that all scuppers are properly plugged during transfer operations except on tank vessels using water for deck cooling. Sea valves shall be closed and lashed, or sealed to indicate that they should not be open during all cargo loading operations. Under no circumstances shall such valves be secured by locks.

35.35–15 Connecting for cargo transfer—TB/ALL. (a) Movement of the vessel shall be considered when making the cargo connections to insure safe cargo transfer. Suitable material shall be used in joints and in couplings when making connections to insure that they are tight. Under no circumstances shall less than three bolts be used in a bolted flanged coupling.

(b) When cargo connections are supported by ship's tackle, the senior deck officer on duty shall determine the weights involved in order to insure that sufficient tackles are used.

(c) Pans or buckets shall be placed under cargo hose connections on the tank vessel.

35.35–20 Inspection prior to transfer of cargo—TB/ALL. Prior to the transfer of cargo, the senior deck officer on duty, who shall be a licensed officer or certificated tankerman, shall inspect the vessel to assure himself that the following conditions exist:

(a) Warnings are displayed as required.

(b) No repair work in way of cargo spaces is being carried on without his permission.

(c) Cargo connections have been made as described in Section 35.35–15 and cargo valves are set.

(d) All cargo connections for the loading of Grades A, B, and C cargoes have been made to the vessel's pipelines and not through open end hose in a hatch.

(e) In loading Grades A, B, and C cargoes, there are no fires or open flames present on the deck, or in any compartment which is located on, facing, open, and adjacent to that part of the deck on which cargo connections have been made.

(f) The shore terminal or the other tank vessel concerned has reported itself in readiness for transfer of cargo.

(g) All sea valves connected to the cargo piping system are closed.

(h) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether boiler fires can be maintained with reasonable safety.

(i) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether galley fires can be maintained with reasonable safety.

(j) In loading Grades A, B, and C cargoes, that an inspection has been made to determine whether smoking may be permitted with reasonable safety.

(k) On tankships the construction or conversion of which is started on or after July 1, 1951, which are to load or discharge Grade A cargo, all openings in the top of the tanks, except the branch vent lines and covers to ullage hole sounding pipes, are tightly closed. (See Sections 32.20–20 and 32.55–20 of this subchapter.)

(l) On tankships the construction or conversion of which is started on or after July 1, 1951, which are to load or discharge Grade A cargo, the method for determining the liquid level in the tank without opening ullage holes, cargo hatches or Butterworth plates is in proper order. (See Section 32.20–20 of this subchapter.)

35.35–25 Approval to start transfer of cargo—TB/ALL. When the senior deck officer on duty has assured himself that the requirements of Sections 35.35–20 and 35.35–30 have been met, he may give his approval to start operations.

35.35–30 "Declaration of Inspection" for tankships—T/ALL. After completing the inspection required by Section 35.35–20 and prior to giving his approval to start the cargo transfer operation, the master or senior deck officer on duty shall fill in the following Declaration of Inspection in duplicate. The original of the Declaration of Inspection shall be kept aboard for the information of authorized persons. The duplicate, where required, shall be handed to the terminal superintendent or his representative, who shall on demand be given the opportunity to satisfy himself that the condition of the vessel is as stated in the Declaration of Inspection.

DECLARATION OF INSPECTION PRIOR TO BULK CARGO TRANSFER

Date_____

S_____ Port of_____

I, _____, being the master or senior deck officer in charge of the transfer of bulk flammable and combustible cargo about to be undertaken, do certify that I have personally inspected this vessel with reference to the following requirements set forth in Section 35.35–20 and that opposite each of them I have indicated that the regulations have been complied with.

(1) Are warnings displayed as required?

(2) Is there any repair work in way of cargo spaces being carried on for which permission has not been given?

(3) Have cargo connections been properly made and are cargo valves properly set?

(4) Have all cargo connections for loading Grades A, B, and C cargoes been made to vessel's pipelines?

(5) Are there any fires or open flames present on the deck or in any compartment which is located on, facing, open and adjacent to the main deck of the vessel on which the cargo connections have been made?

(6) Has the shore terminal or other tank vessel concerned reported itself in readiness for transfer of cargo?

(7) Are sea valves connected to the cargo system closed?

(8) If Grades A, B, and C cargoes are to be loaded and boiler fires are lighted, has an inspection been made to determine that they may be operated with reasonable safety?

(9) If Grades A, B, and C cargoes are to be loaded and galley fires are lighted, has an inspection been made to determine that they may be operated with reasonable safety?

(10) If Grades A, B, and C cargoes are to be loaded, has an inspection been made to determine whether smoking is to be permitted?

(11) If smoking is to be permitted, have spaces been designated for this purpose?

35.35–35 Duties of senior deck officer during transfer operations—TB/ALL. The senior deck officer on duty shall control the operations as follows:

(a) Supervise the operations of cargo system valves.

(b) Start transfer of cargo slowly.

(c) Observe cargo connections for leakage.

(d) Observe operating pressure on cargo system.

(e) Observe rate of loading for the purpose of avoiding overflow of tanks.

35.35–40 Conditions under which transfer operations shall not be commenced or if started shall be discontinued—TB/ALL. Cargo transfer operations shall not be started or, if started, shall be discontinued under the following conditions:

(a) During severe electrical storms.

(b) If a fire occurs on the wharf or on the tanker or in the vicinity.

35.35–42 Restrictions on vessel coming alongside a tank vessel while loading Grade A, B, or C cargo—TB/ALL. (a) No vessel shall come alongside or remain alongside a tank vessel in way of its cargo tanks while it is loading Grade

A, B or C cargo without having the permission of the officer-in-charge of the vessel which is loading.

(b) No vessel shall come alongside or remain alongside a tank vessel in way of its cargo tanks while it is loading Grade A, B or C cargo unless the conditions then prevailing are mutually acceptable to the officers-in-charge of cargo handling on both vessels.

35.35–45 Auxiliary steam, air, or electric current—B/ALL. When discharging cargo from one or more barges, the towing vessel may furnish steam, air, or electric current for pumps on barges or dock, but in no case shall the cargo pass through or over the towing vessel.

35.35–50 Termination of transfer operations—TB/ALL. (a) When transfer operations are completed the valves on cargo connections on the vessel shall be closed. The cargo connections shall be drained of cargo.

35.35–55 Transfer of other cargo or stores on tank vessels—TB/ALL. (a) Packaged goods, freight, and ships' stores shall not be loaded or discharged during the loading of Grade A, B, or C products except by permission of the senior deck officer on duty. Explosives as cargo shall not be loaded or carried on any tank vessel containing Grade A, B, or C cargo.

(b) Where package and general cargo is carried directly over bulk cargo tanks, it shall be properly dunnaged to prevent chafing of metal parts and securely lashed or stowed.

35.35–60 Transportation of other cargo or stores on tank barges—B/ALL. (a) Tank barges may be permitted to transport deck cargoes directly over bulk cargo spaces when the nature of such deck cargoes and the methods of loading and unloading same do not create an undue hazard. Such tank barges shall have their decks properly dunnaged to prevent chafing between the steel parts of the vessel and the deck cargo.

35.35–70 Maintenance of cargo handling equipment—TB/ALL. The cargo handling equipment shall be maintained by the tank vessel's personnel in accordance with the regulations in this subchapter, including the following:

(a) Cargo hose shall not be used in transfer operations in which the pressures are such that leakage of cargo occurs through the body of the hose.

(b) Cargo pump relief valves shall be tested at least once each year to determine that they function satisfactorily at the pressure at which they are set to open.

(c) Cargo pump pressure gage shall be tested at least once a year for accuracy.

(d) The cargo discharge piping of all tank vessels shall be tested at least once each year for tightness, at the maximum working pressure.

35.35–75 Emergencies—TB/ALL. In case of emergencies nothing in the regulations in this subchapter shall be construed as preventing the senior officer present from pursuing the most effective action in his judgment for rectifying the conditions causing the emergency.

SUBPART 35.40—MARKING OF FIRE AND EMERGENCY EQUIPMENT

35.40–1 General alarm contact maker—TB/ALL. Each general alarm bell contact maker located as required in Paragraph 32.25–1 (b) shall be marked with lettering on a corrosion-resistant plate, or with a sign in red letters on a suitable background with the words "GENERAL ALARM."

35.40–5 General alarm bells—TB/ALL. General alarm bells shall be marked in not less than ½-inch red letters: "GENERAL ALARM—WHEN BELL RINGS GO TO YOUR STATION."

35.40–6 Emergency lights—TB/ALL. (a) All emergency lights shall be marked with a letter "E" at least ½ inch high.

35.40–7 Carbon dioxide alarm—T/ALL. Adjacent to all carbon dioxide fire extinguishing alarms installed after November 19, 1952, there shall be conspicuously marked: "WHEN ALARM SOUNDS VACATE AT ONCE. CARBON DIOXIDE BEING RELEASED."

35.40–10 Steam, foam, or CO_2 fire smothering apparatus—TB/ALL. Steam, foam or CO_2 fire smothering apparatus shall be marked "STEAM FIRE APPARATUS" or "FOAM FIRE APPARATUS" or "CO_2 FIRE APPARATUS," as appropriate, in not less than 2-inch red letters. The valves of all branch pipes leading to the several compartments shall be distinctly marked to indicate the compartments or parts of the vessel to which they lead.

35.40–15 Firehose stations—TB/ALL. At each firehose valve there shall be marked in not less than 2-inch red letters and figures: "FIRE STATION 1," 2, 3, etc.

35.40–17 Foam hose/monitor stations—T/ALL. (a) At each required foam hose/monitor valve there shall be marked in not less than 2-inch red letters and figures: "FOAM STATION 1," 2, 3, etc.

35.40–18 Water spray systems—TB/ALL. (a) Water spray system apparatus shall be marked: "WATER SPRAY SYSTEM," as appropriate, in not less than 2-inch red letters.

(b) The control valve, and its control if located remotely, shall be distinctly marked to indicate the compartment protected.

35.40–20 Emergency equipment—TB/ALL. Lockers or spaces where emergency equipment is stowed shall be marked: "EMERGENCY EQUIPMENT"

OR "FRESH AIR BREATHING APPARATUS" as appropriate.

35.40–25 Fire extinguishers — T B / A L L. Each fire extinguisher shall be marked with a number and the location where stowed shall be marked in corresponding numbers in at least ½ inch figures.

35.40–30 Instructions for changing steering gear—TB/ALL. Instructions in at least ½ inch letters and figures shall be posted in the steering engineroom, relating in order, the different steps to be taken in changing to the emergency steering gear. Each clutch, gear wheel, lever, valve or switch which is used during the changeover shall be numbered or lettered on a brass plate or painted so that the markings can be recognized at a reasonable distance. The instructions shall indicate each clutch or pin to be "in" or "out" and each valve or switch which is to be "opened" or "closed" in shifting to any means of steering for which the vessel is equipped. Instructions shall be included to line up all steering wheels and rudder amidship before changing gears.

35.40–35 Rudder orders—TB/ALL. At all steering stations, there shall be installed a suitable notice on the wheel or device or in such other position as to be directly in the helmsman's line of vision, to indicate the direction in which the wheel or device must be turned for "right rudder" or "left rudder."

35.40–40 Vessel's name on equipment—TB/ALL. (a) The equipment of all tank vessels, such as firehose, fire axes, lifeboats, liferafts, life preservers and buoyant apparatus, shall be painted or branded with the name of the vessel upon which they are used, except that inflatable liferafts shall be marked in accordance with Section 33.25–10.

(b) For vessels on an international voyage, in addition to other markings required, the port of registry of the vessel shall be marked on all lifeboats, rigid liferafts, buoyant apparatus, and ring life buoys. On lifeboats, the name of the vessel and the port of registry shall be marked on each side of the bow.

SUBPART 35.70—POWER-OPERATED INDUSTRIAL TRUCKS

35.70–1 Application—TB/ALL. (a) Power-operated industrial trucks. (1) Power-operated industrial trucks when carried on board vessels as part of the vessel's equipment for handling materials of any kind shall be in compliance with the applicable provisions of this subpart.

(2) Power-operated industrial trucks placed on board vessels for handling materials of any kind shall be in compliance with the applicable provisions of this subpart when such vessels are within the navigable waters of the United States, its territories and possessions but not including the Panama Canal Zone.

(b) Vessels. (1) Vessels shall be in compliance with the applicable provisions of this Subpart during those periods of time when power-operated industrial trucks are on board as a part of the vessel's equipment or when such trucks are placed on board for handling materials of any kind.

NOTE: As set forth in paragraph 30.01–5(e), the regulations in this subpart are also applicable to foreign flag tank vessels.

35.70–3 Alternates—TB/ALL. (a) In cases of undue hardship resulting from unavoidable delays in bringing existing power-operated industrial trucks into compliance with the applicable provisions of this subpart, the Commandant may permit the use of alternate equipment, apparatus, or arrangement for such period of time, and to such extent, and upon such conditions as will assure, to the Commandant's satisfaction, a degree of safety consistent with the minimum standards as set forth in this subpart.

(b) The methods and procedures adopted in connection with the modification of existing equipment to meet required laboratory designations will be taken into consideration in granting permission to use alternate arrangements for a limited period of time.

35.70–5 Definitions of terms used in subpart—TB/ALL. (a) Power-operated industrial trucks are considered to be tractors, lift trucks and other specialized indnstrial trucks used for material handling on board a vessel.

(b) For the purposes of the regulations in this subpart, the words "flammable" and "inflammable" are interchangeable or synonymous terms.

35.70–7 Approved power-operated industrial trucks—TB/ALL. (a) Where approved power-operated industrial trucks are required by the regulations in this subchapter, such approved trucks shall have a specific designation of a recognized testing laboratory except in case of trucks powered by compressed air. The following laboratories are recognized for the specific type designations listed:

(1) Underwriters' Laboratories, Inc. (Mailing address, P.O. Box 247, Northbrook, Illinois, 60062) for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D, and DS.

(2) Factory Mutual Laboratories, Engineering Division, 1115 Boston-Providence Turnpike, Norwood, Massachusetts, 02062, for trucks having recognized testing laboratory type designations E, EE, EX, G, GS, LP, LPS, D, and DS.

(b) Trucks powered by compressed air which is received through a flexible hose from a fixed source and having the air supply hose of the grounded type shall be considered of the approved type for purposes of this subpart.

(c) Description of recognized testing laboratory type designations are as follows:

(1) The "E" designated units are electrically powered units that have minimum acceptable safeguards against inherent fire hazards.

(2) The "EE" designated units are electrically powered units that have, in addition to all of the requirements for the "E" units, the electric motors and all other electrical equipment completely enclosed. In certain locations the "EE" unit may be used where the use of an "E" unit may not be considered safe.

(3) The "EX" designated units are electrically powered units that differ from the "E" and "EE" units in that the electrical fittings and equipment are so designed constructed and assembled that the units may be used in certain atmospheres containing flammable vapors or dusts.

(4) The "G" designated units are gasoline powered units having minimum acceptable safeguards against inherent fire hazards.

(5) The "GS" designated units are gasoline powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where the use of a "G" unit may not be considered safe.

(6) The "LP" designated units are similar to the "G" units except that they are liquefied petroleum gas engine powered instead of gasoline powered.

(7) The "LPS" designated units are units similar to the "GS" units except that liquefied petroleum gas is used for fuel instead of gasoline.

(8) The "D" designated units are units similar to the "G" units except that they are diesel engine powered instead of gasoline engine powered.

(9) The "DS" designated units are diesel powered units that are provided with additional safeguards to the exhaust, fuel and electrical systems. They may be used in some locations where a "D" unit may not be considered safe.

(d) In addition to the construction and design safety features required in order to obtain a recognized laboratory type designation, approved power-operated industrial trucks shall have at least the following minimum safety features where applicable.

(1) Power-operated industrial trucks shall be equipped with a warning horn, whistle, or gong, or other device that can be heard clearly above the normal shipboard noises.

(2) Wherever power-operated industrial truck operation exposes the operator to danger from falling objects, the truck shall be equipped with a driver's overhead guard. Where overall height of the truck with forks in the lowered position is limited by head room conditions the overhead guard may be omitted.

NOTE: This overhead guard is only intended to offer protection from the impact of small packages, boxes, bagged material, etc., representative of the job application. It is impractical to build a guard of sufficient strength to withstand the impact of a capacity load since such a guard would constitute a safety hazard because its structure would be so large that it might interfere with good visibility and would weigh so much that it might make the truck topheavy and unstable.

(3) Power-operated fork lift trucks which handle small objects or unstable loads shall be equipped with a vertical load back rest or rack which shall have height, width and strength sufficient to prevent the load, or part of it, from falling toward the mast when the mast is in a position of maximum backward tilt.

(4) The forks on power-operated fork lift trucks shall be secured to the carriage so that unintentional lifting of the toe shall not occur on such application where this lifting may create a hazard. The factor of safety of forks shall be at least 3 to 1, based on the elastic limit of the material.

(5) Fork extensions or other attachments shall be suitably secured to prevent unintentional lifting or displacement on primary forks.

(6) All exposed wheels shall be provided with guards to prevent the wheels from throwing particles at the operator.

(7) Unless the steering mechanism is of a type that prevents road reactions from causing the steering handwheel to spin, the steering knob, if used, shall be of a mushroom type to engage the palm of the operator's hand, or shall be arranged in some other manner to prevent injury. The knob shall be mounted within the perimeter of the wheel.

(8) All steering controls shall be confined within the clearances of the truck, or so guarded that movement of the controls shall not result in injury to the operator when passing obstructions, stanchions, etc.

35.70–10 Permissible areas of use—TB/ALL.

(a) When the area on deck or in the hold in which power-operated industrial trucks are to be used has no bulk cargo vapors when tested but is an area in which such vapors could accumulate, these trucks may be used subject to the following conditions:

(1) Trucks used shall be suitable for type of cargo to be handled in accordance with Section 35.70–15.

(2) Trucks used shall be suitable for areas in which vapors could accumulate in accordance with Table 35.70–10(a).

TABLE 35.70–10(a)

Type of truck	Grade of bulk cargo/vapors in vessel				
E					E
EE		B	C	D	E
EX	A	B	C	D	E
LP					E
LPS		B	C	D	E
G					E
GS		B	C	D	E
D					E
DS		B	C	D	E
Compressed air	A	B	C	D	E

(b) When a vessel is gas free, any approved truck can be used in any space except for restrictions as to types of cargo handled as specified in Section 35.70–15.

35.70–15 Types of cargo permitted to be handled by trucks—TB/ALL. (a) Power-operated industrial trucks used for handling of packaged petroleum products shall be in accordance with Table 35.70–15(a).

TABLE 35.70–15(a)

Type of truck	Grade of packaged petroleum product				
E				D	E
EE		B	C	D	E
EX	A	B	C	D	E
LP				D	E
LPS		B	C	D	E
G				D	E
GS		B	C	D	E
D				D	E
DS		B	C	D	E
Compressed air	A	B	C	D	E

(b) Where dry cargo other than packaged petroleum products is to be handled by power-operated industrial trucks on board a tank vessel, types of trucks used shall be in accordance with Section 97.70–10 of Subchapter I (Rules and Regulations for Cargo and Miscellaneous Vessels) of this Chapter, except that all trucks shall be approved.

(c) The use of power-operated industrial trucks may be further restricted due to bulk cargo and/or vapors as set forth in Table 35.70–10(a).

35.70–20 Special operating conditions—TB/ALL. (a) Permission shall be obtained from the senior deck officer on board before placing power-operated industrial trucks in operation on a tank vessel.

(b) The senior deck officer shall ascertain by portable carbon monoxide and explosive vapor meters, if necessary, that no hazardous gas concentrations exist before granting permission to operate power trucks.

(c) When power-operated industrial trucks are in use on board vessels subject to the regulations in this subchapter, they shall be in a safe operating condition.

(d) Spaces exposed to carbon monoxide or other hazardous vapors from the exhausts of power-operated industrial trucks shall have adequate ventilation. The concentration of carbon monoxide shall be kept below 100 parts per million in the holds and intermediate decks where persons are working. When necessary, portable blowers of adequate size and location shall be utilized.

(e) The parts and/or equipment of any power-operated industrial truck requiring replacement shall be replaced only by parts and/or equipment equivalent in safety when installed with those used in the original design.

(f) Any truck that emits sparks or flames from the exhaust system shall immediately be removed from service, and not again returned to service until the cause for the emission of such sparks or flames has been eliminated.

(g) When the temperature of any part of the truck is found to be in excess of a safe operating temperature, the truck shall be removed from service until such overheating has been corrected.

(h) Operation of trucks shall be halted immediately and the engines or motors secured, whenever an emergency condition arises aboard the vessel.

(i) Operation of trucks shall be halted immediately and the engines or motors secured in the event of breakage or leakage of containers used for the carriage of flammable liquids, flammable solids or oxidizing materials.

(j) The rated capacity of a truck shall at all times be posted on the truck in a conspicuous place and such capacity shall not be exceeded.

(k) At least one approved 2-pound dry chemical hand portable fire extinguisher, or its approved equivalent, shall be affixed to the truck in a readily accessible position or kept in close proximity available for immediate use.

(l) Vessel's firefighting equipment, both fixed (where installed) and portable, in vicinity of space being worked shall be kept ready for immediate use.

35.70–25 Refueling—TB/ALL. (a) When permitted. Power-operated industrial trucks are not permitted to be refueled in the hold of a vessel or on the weather deck except under the following conditions:

(1) Trucks using gasoline as fuel may be refueled in the hold or on the weather deck of a vessel only when such refueling is done with an acceptable portable non-spilling fuel handling system of not over 5 gallons capacity. Transfer of gasoline to these portable non-spilling fuel handling devices is not permitted on board the vessel.

(2) Power-operated industrial trucks using liquefied petroleum gas as fuel may be refueled in the hold or on the weather deck of a vessel only when fitted with removable tanks and provided the hand-operated shutoff valve of the depleted tank is closed and the engine is run until it stalls from lack of fuel before the quick disconnect fitting is opened. In addition, the quick disconnect fitting shall be attached to the fuel tank before the hand-operated shutoff valve is reopened.

(3) Power-operated industrial trucks using diesel oil as fuel may be refueled on the weather deck or in the hold of a vessel by means of portable containers of not over 5-gallon capacity. These trucks may also be refueled on the weather deck of a vessel or portable containers refilled from a larger container provided a suitable pump is used for the transfer operation and a drip pan of adequate size is supplied.

(b) General requirements. The following conditions must be met when refueling power-operated industrial trucks in the hold of a vessel or on the weather deck under the circumstances listed in paragraph (a) of this section:

(1) Refueling shall be under the direct supervision of an experienced and responsible person specifically designated for such job by the person in charge of the loading or unloading of the vessel.

(2) No refueling shall be undertaken with less than 2 persons specifically assigned and present for the complete operation, at least one of whom shall be experienced in using the portable fire extinguishers required in the fueling area.

(3) At least one approved 4-pound dry chemical hand portable fire extinguisher, or its approved equivalent shall be provided at the scene of the fueling area. This is in addition to the portable extinguisher affixed to the truck in accordance with paragraph 35.70–20(k).

(4) The location for refueling trucks shall be designated by the master or senior deck officer on board the vessel. "No Smoking" signs shall be posted in the area and smoking shall be prohibited.

(5) The location designated for refueling shall be adequately ventilated so as to insure against accumulation of a hazardous concentration of vapors. The ventilation requirements of paragraph 35.70–20 (d) when trucks are operating shall also apply when trucks are being refueled.

(6) Truck engines of all trucks in the same hold shall be stopped before any truck in that hold is refueled and before any fuel handling devices or unmounted liquefied petroleum gas cylinders are placed in the hold.

(7) All fuel handling devices and unmounted liquefied petroleum gas containers shall be removed from the hold before any truck engine is started and the trucks again placed in operation.

35.70–30 Charging or replacing batteries—TB/ALL. (a) Battery charging or battery replacement on electric powered trucks shall not be accomplished on board the vessel in locations where vapors from Grades "A," "B," "C," or "D" cargo could accumulate.

(b) Locations on board vessel for battery charging or replacement shall be designated by the master of the vessel.

(c) Battery charging on board vessel shall be accomplished in accordance with the following provisions:

(1) The batteries shall be housed in a suitable, ventilated, portable metal container with a suitable outlet at the top for connection of a portable airhose, or shall be placed directly beneath a suitable metal hood with a suitable outlet at the top for connection of a portable airhose. The airhose shall be permanently connected to an exhaust duct leading to the open deck and terminate in a gooseneck or other suitable weather head. If natural ventilation is not practicable or adequate, mechanical means of exhaust shall be employed in conjunction with the duct. The air outlet on the battery container shall be equipped with an interlock switch so arranged that the charging of the battery cannot take place unless the airhose is properly connected to the box.

(2) If mechanical ventilation is used, an additional interlock shall be provided between the fan and the charging circuit so that the fan must be in operation in order to complete the charging circuit for operation. It is preferable that this interlock switch be of a centrifugal type driven by the fan shaft.

(3) The charging facilities may be part of the truck equipment or may be separate from the truck and located inside or outside the cargo hold. The supply or charging circuit (whichever method is used) shall be connected to the truck by a portable plug connection of the break-away type. This portable plug shall be so engaged with the truck battery charging outlet that any movement of the truck away from the charging station will break the connection between the plug and receptacle without exposing any live parts to contact with a conducting surface or object, and without the plug falling to the deck where it may become subject to injury.

(d) Suitable materials handling equipment shall be employed and adequate precautions taken to avoid damaging or short circuiting batteries and to avoid spillage of electrolyte.

(e) All unmounted batteries shall be removed from the hold where trucks will be operated before such operation commences.

35.70–35 Stowage of trucks aboard a vessel—TB/ALL. (a) Power-operated industrial trucks may be stowed in any location aboard a vessel provided the following conditions are met:

(1) Gasoline powered trucks shall have all the fuel expended from the system.

(2) Liquefied petroleum gas powered trucks shall have the fuel tanks removed and all the fuel expended from the system.

(b) Power-operated industrial trucks not meeting the conditions set forth in paragraph (a) of this section shall be stowed on the open deck except for intervals such as lunch hours, between work shifts, interdock and intraport movements. If stowed in a fixed metal enclosure located on or above the weather deck, such enclosure shall have access from the weather deck only and shall have adequate ventilation, so arranged as to remove vapors from both the upper and lower portions of the space.

PART 36—ELEVATED TEMPERATURE CARGOES

SUBPART 36.01—GENERAL

Sec.
36.01–1 Scope of regulations—TB/ALL.
36.01–5 Certificate of inspection—TB/ALL.

SUBPART 36.05—CARGO TANKS

36.05–1 Installation of cargo tanks—TB/ALL.
36.05–10 Protection of personnel—TB/ALL.

SUBPART 36.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

36.10–1 Cargo pump relief valves—TB/ALL.

SUBPART 36.20—VENTS AND VENTILATION

36.20–1 Flame screens—TB/ALL.
36.20–5 Ventilation of pumproom—TB/ALL.

SUBPART 36.30—PERIODIC INSPECTIONS

36.30–1 Lagged tanks—TB/ALL.

AUTHORITY: The provisions of this Part 36 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Interpret or apply R.S. 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp. Additional authority is cited in parentheses following the sections affected.

SUBPART 36.01—GENERAL

36.01–1 Scope of regulations—TB/ALL. (a) The regulations in this part contain requirements for the transportation in bulk of materials considered to be Grade E liquids when shipped in molten form at elevated temperatures.

(b) The materials covered by this part shall meet the applicable regulations of this subchapter, except that materials having a flashpoint of 300° F. or above, shall be exempt from the requirements prescribed in the following sections of this subchapter:

(1) Inspection prior to making repairs—Paragraph 35.01–1(b).

(2) Watchman for a tank vessel—Section 35.05–15.

(3) Warning sign at gangway—Paragraph 35.30–1(b).

(4) Cargo tank hatches, ullage holes and Butterworth plates—Section 35.30–10.

(5) Men on duty—Section 35.35–1.

(6) Inspection prior to transfer of cargo—Section 35.35–20.

(7) Approval to start transfer of cargo—Section 35.35–25.

(8) "Declaration of inspection" for tankships—Section 35.35–30.

(9) Transportation of other cargo or stores on tank barges—Section 35.35–60.

(c) The regulations governing the transportation in the solid state of materials referred to in Paragraph 36.01–1(a) are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

36.01–5 Certificate of inspection—TB/ALL. (a) The certificate of inspection shall be endorsed for the carriage of elevated temperature cargoes as follows: "Inspected and approved for the carriage of Grade E combustible liquids when transported in molten form at elevated temperatures."

(R.S. 4421, as amended; 46 U.S.C. 399)

SUBPART 36.05—CARGO TANKS

36.05–1 Installation of cargo tanks—TB/ALL. (a) All cargo tanks carrying liquids at elevated temperatures for the purpose of maintaining the material in the molten form shall be installed with the access openings located above the weather deck.

36.05–10 Protection of personnel—TB/ALL. (a) Decks, bulkheads, or other structure shall be insulated with an approved incombustible material, or other suitable means of protection shall be employed where practicable and necessary for the protection of personnel.

SUBPART 36.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

36.10–1 Cargo pump relief valves—TB/ALL. (a) Cargo pump relief valves and pressure gages may be omitted, however a suitable device shall be fitted to stop the pumping before the designed pressure of the piping is exceeded.

SUBPART 36.20—VENTS AND VENTILATION

36.20–1 Flame screens—TB/ALL. (a) Flame screens may be omitted in the vent lines on cargo tanks.

36.20–5 Ventilation of pumproom—TB/ALL. (a) Where personnel are required to enter pumprooms located below the weather deck under normal circumstances of handling cargo, such pumprooms shall be equipped with power ventilation.

SUBPART 36.30—PERIODIC INSPECTIONS

36.30–1 Lagged tanks—TB/ALL. (a) Lagged tanks shall have part of the lagging removed on the lower portion of the cargo tanks as directed by the marine inspector, at least once every eight years for external examination.

PART 37—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISIONS FOR NUCLEAR VESSELS

SUBPART 37.01—APPLICATION

Sec.

37.01–1 General—TB/ALL.

SUBPART 37.05—DESIGN AND CONSTRUCTION

37.05–1 Special requirements—TB/ALL.
37.05–5 Subdivision and stability—TB/ALL.
37.05–10 Location of nuclear system components—TB/ALL.

SUBPART 37.10—INSPECTION AND CERTIFICATION

37.10–1 Annual inspection and certification required—TB/ALL.
37.10–5 Additional requirements—TB/ALL.
37.10–15 International Convention certification—T/ALL.

SUBPART 37.15—OTHER SPECIAL PROVISIONS

37.15–1 Radiation—TB/ALL.
37.15–3 Means for preventing uncontrolled release of radiation—TB/ALL.
37.15–5 Atomic Energy Commission safety requirements—TB/ALL.
37.15–10 Safety assessment—TB/ALL.

SUBPART 37.20—OPERATIONS

37.20–1 Operating Manual—TB/ALL.
37.20–5 Special operating procedures—TB/ALL.

AUTHORITY: The provisions of this Part 37 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 2, 23 Stat. 118, as amended, secs. 2, 633, 63 Stat. 496, 545, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 2, 14 U.S.C. 2, 633, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). R.S. 4417, as amended, 4418, as amended, 4433, as amended, 4453, as amended, 4472, as amended, 41 Stat. 305, as amended, secs. 1, 2, 49 Stat. 1544, 1545, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 391, 392, 411, 35, 170, 363, 367, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp.

SUBPART 37.01—APPLICATION

37.01–1 General—TB/ALL. (a) The provisions of this part shall apply to all installations, systems, and components thereof, utilizing nuclear energy for propulsion or for any other purpose. They shall include vessels handling substantial quantities of radioactive materials other than cargo.

SUBPART 37.05—DESIGN AND CONSTRUCTION

37.05–1 Special requirements—TB/ALL. (a) The features described in this section shall be provided in nuclear vessels regardless of length or gross tonnage.

(b) A temporary and final source of emergency power, as required for oceangoing passenger vessels over 1,600 gross tons, shall be provided to insure an uninterrupted power supply to nuclear instrumentation, control, and safety systems. For applicable requirements see Section 112.05–5(a) of Subchapter J (Electrical Engineering) of this chapter.

(c) Bilge system arrangements, as required for self-propelled oceangoing passenger vessels over 300 feet, shall be provided. For applicable requirements see Sections 56.50–50 and 56.50–55 of Subchapter F (Marine Engineering) of this chapter.

(d) The boundary bulkheads and decks separating the reactor compartment, other compartments containing vital primary system equipment, nuclear chemistry laboratories, and reactor control spaces from accommodations, galley, main pantries, and machinery spaces requiring fixed type extinguishing systems shall be of A–60 construction. For definition of Class A–60 construction, see Subpart 72.05 of Subchapter H (Passenger Vessels) of this chapter.

37.05–5 Subdivision and stability—TB/ALL. (a) Watertight subdivision and damage stability requirements shall satisfy not less than a two-compartment standard. Whenever practicable they should be at least equivalent to that required for a conventionally powered oceangoing passenger vessel of similar size, capacity, and tonnage.

(b) A full double bottom shall be provided, regardless of the actual length of the vessel, as required by Subpart 73.25 of Subchapter H (Passenger Vessels) of this chapter for vessels over 249 feet in length.

(c) In assessing stability, direct calculations shall be utilized which take into account the form and proportions of the hull. The details of such calculations shall be in accordance with the provisions of Parts 73 and 74 of Subchapter H (Passenger Vessels) of this chapter except that subdivision and damage stability calculations will be based on the most severe permeability assumptions applicable to each compartment, having regard for its actual use.

37.05–10 Location of nuclear system components—TB/ALL. (a) The location of the nuclear system components in the vessel and the manner in which they are supported shall be approved by the Commandant. In determining the location and the necessary structural support and protection required, the effects of grounding, collision or other mishap resulting in holing of the vessel shall be considered.

(b) Reactor installations, including all potentially vulnerable primary system components, shall be placed as far inboard from the shell as practicable. Generally, the installation shall be situated inboard of a vertical surface perpendicular to the waterplane. The vertical surface shall be

located at a minimum distance (measured at right angles to the centerline at the deepest loadline) inboard of the shell equal to one-fifth of the extreme breadth of the vessel. If the installation extends outboard of this vertical surface, special consideration shall be given to collision protection.

(c) Reactor installations shall be located a reasonable height above the ship's bottom, but in no case shall this height be less than the required double bottom height. Waste storage tanks and engineered safeguard systems may be permitted in the double bottom space if specifically approved by the Commandant. Consideration shall be given to collision-analysis statistics with regard to the longitudinal (fore and aft) location of the reactor installation.

SUBPART 37.10—INSPECTION AND CERTIFICATION

37.10-1 Annual inspection and certification required—TB/ALL. (a) Every nuclear vessel subject to the regulations in this subchapter shall be inspected by the U.S. Coast Guard at least annually to ascertain that the hull, nuclear systems, machinery, equipment, appliances, etc., of the vessel comply with the applicable regulations in this chapter.

(b) Every nuclear vessel found to be in compliance with applicable requirements in this subchapter will be issued a certificate of inspection in accordance with Part 31 of this subchapter.

37.10-5 Additional requirements—TB/ALL. (a) In addition to the requirements for inspection, test, overhaul and repair specified in this subchapter, nuclear vessels may be subject to such additional requirements as may be prescribed by the Commandant for inspection, test, overhaul, and repair. For applicable requirements see Subpart 61.25 of Subchapter F (Marine Engineering) of this chapter.

(b) A prerequisite for annual recertification of the vessel will be a valid Atomic Energy Commission's facility operating license, or if nonlicensed a certificate from the Atomic Energy Commission stating that the nuclear installation complies with the requirements of the Commission.

37.10-15 International Convention Certification—T/ALL. (a) For applicable requirements governing Safety of Life at Sea Convention certificates see Sections 31.40-1, 31.40-2, and 31.40-40(c) of this subchapter.

SUBPART 37.15—OTHER SPECIAL PROVISIONS

37.15-1 Radiation—TB/ALL. (a) The vessel shall be so designed, constructed and operated that no unreasonable hazard of radiation at sea or in port for crew, food, water supply, passengers, public, or waterways exists.

(b) The Atomic Energy Commission's Standards for Protection Against Radiation, set forth in 10 CFR Part 20, will be the radiation protection standards followed by the U.S. Coast Guard, except as otherwise provided for by law.

37.15-3 Means for preventing uncontrolled release of radiation—TB/ALL. (a) The vessel's nuclear systems, including all components thereof, shall be provided with means for preventing the uncontrolled release of hazardous amounts of radioactive material to normally accessible spaces on the ship or to the ship's environment in the event of accident or malfunction of any such system.

37.15-5 Atomic Energy Commission safety requirements—TB/ALL. (a) Before a Coast Guard certificate of inspection for a nuclear vessel will be issued, it must be shown that the nuclear system meets the safety requirements of the Atomic Energy Commission. After facility licensing, possession of a valid AEC license will attest to this fact. Prior to this licensing, a letter from the Commission to the Coast Guard with assurance that the system does meet the safety requirements of the Atomic Energy Commission is required.

37.15-10 Safety assessment—TB/ALL. (a) A safety assessment shall be prepared to permit evaluation of the nuclear powerplant and safety of the ship, and to ensure that there are no unreasonable radiation or other hazards, at sea or in port, to the crew, passengers or public, or to the waterways or food or water resources.

(b) The safety assessment shall be submitted to the Commandant for approval and shall always be kept up-to-date.

(c) The safety assessment will be used as a basis for establishing orderly negotiations between the United States and governments of countries which a nuclear vessel intends to visit to permit entry of nuclear ships into ports of different countries.

SUBPART 37.20—OPERATIONS

37.20-1 Operating manual—TB/ALL. (a) A fully detailed Operating Manual shall be prepared for the information and guidance of the operating personnel in their duties on all matters relating to the operation of the nuclear powerplant and having an important bearing on safety.

(b) The Operating Manual shall be submitted to the Commandant for approval and shall always be kept up-to-date.

(c) A copy of the Operating Manual shall be kept on board the vessel at all times.

37.20-5 Special operating procedures—TB/ALL. (a) In addition to the requirements specified in this chapter, all nuclear vessels may be subject to additional requirements governing fueling, startup, and operation.

PART 38—LIQUEFIED FLAMMABLE GASES

SUBPART 38.01—GENERAL

Sec.
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38.05-1 Design and construction of vessels—general—TB/ALL.
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SUBPART 38.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

38.10-1 Valves, fittings, and accessories—TB/ALL.
38.10-5 Filling and discharge pipes—TB/ALL.
38.10-10 Cargo piping—TB/ALL.
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38.10-20 Liquid level gaging devices—TB/ALL.

SUBPART 38.15—SPECIAL REQUIREMENTS

38.15-1 Filling of tanks—TB/ALL.
38.15-5 Cargo hose—TB/ALL.
38.15-10 Leak detection systems—T/ALL.
38.15-15 Electrical installations—TB/ALL.
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SUBPART 38.20—VENTING AND VENTILATION

38.20-1 Venting—T/ALL.
38.20-5 Venting—B/ALL.
38.20-10 Ventilation—T/ALL.

SUBPART 38.25—PERIODIC TESTS AND INSPECTIONS

38.25-1 Tests and inspections—TB/ALL.
38.25-5 Removal of defective tanks—TB/ALL.
38.25-10 Safety relief valves—TB/ALL.

AUTHORITY: The provisions of this Part 38 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SUBPART 38.01—GENERAL

38.01-1 Scope of regulations—TB/ALL. (a) The regulations in this part contain requirements for the transportation of liquefied or compressed gases, whose primary hazard is one of flammability.

(b) The transportation "on deck" of liquefied flammable gases in portable cylinders and tanks and the transportation of empty cylinders and portable tanks previously used shall be in accordance with the requirements of Part 146 of Subchapter N (Dangerous Cargoes) of this chapter. The transportation of such containers "under deck" shall be in accordance with the requirements of Section 38.01–2.

38.01-2 Transportation of portable cylinders or portable tanks containing or having previously contained liquefied flammable gases in dry cargo spaces—TB/ALL. (a) DOT cylinders, DOT Specification portable tanks, or other approved portable tanks containing liquefied flammable gases may be transported under deck, provided the following requirements are met:

(1) The cargo space shall be provided with efficient means of ventilation, be protected from artificial heat, and be readily accessible from hatches.

(2) Containers shall be stored in such a position that the safety relief device is in communication with the vapor space of the container. They shall be properly stowed, dunnaged, and secured to prevent movement in any direction.

(3) Unless a method acceptable to the Commandant is used, the containers shall not be overstowed in the same dry cargo space with other liquefied flammable gas containers, nor with other cargo.

(4) The containers shall be suitably protected against physical damage from other cargo, ship's stores, or equipment in such spaces.

(5) Cylinders shall have their valves protected at all times by one of the following methods:

(i) By metal caps securely attached to the cylinders and of sufficient strength to protect the valves from injury.

(ii) By having the valves recessed into the cylinders or otherwise protected so that they will not be subject to a blow if the cylinder is dropped on a flat surface.

(6) Portable tanks shall have their valves protected at all times by a housing in accordance with the requirements under which they were manufactured.

(7) Electrical circuits in such cargo spaces shall meet the requirements of Section 111.60–40 in Subchapter J (Electrical Engineering) of this chapter. If the electrical circuit does not meet such requirements, it must be deenergized by a positive means and not reenergized until the cargo has been removed and the space has been tested and found free of flammable vapor.

(8) During the stowage of portable cylinders or portable tanks in a hold or compartment, that is not fitted with electrical fixtures meeting the requirements of Section 111.60–40, no means of artificial lighting shall be used within the space unless such equipment is of the explosion-proof type. Electrical connections for portable lights shall be made from outlets on the weather deck. Hand flashlights used in the stowage area shall be of an approved type.

(9) The following dangerous cargoes shall not be stowed in the same hold or compartment with liquefied flammable gas containers:

(i) Class A, B, or C explosives.
(ii) Flammable solids.
(iii) Oxidizing materials.
(iv) Corrosive liquids.
(v) Poisonous articles.
(vi) Cotton and similar fibrous materials.

(R.S. 4472, as amended, 4488, as amended, 46 U.S.C. 170, 481.)

38.01–5 Certificate of inspection—TB/ALL. (a) The certificate of inspection shall be endorsed for the carriage of liquefied flammable gases as follows:

Inspected and approved for the carriage of liquefied flammable gases (1) at a pressure not to exceed _____ p.s.i., and (2) at temperatures not less than _____° F.

(b) Tanks approved to carry cargoes at below ambient temperatures shall have the applicable limiting temperatures indicated on the certificate. Tanks designed to carry cargoes only at ambient temperatures should have the word "ambient" entered in these spaces.

(R.S. 4421, as amended; 46 U.S.C. 399.)

SUBPART 38.05—DESIGN AND INSTALLATION

38.05–1 Design and construction of vessels—general—TB/ALL. (a) Vessels designed for the carriage of liquefied gases shall comply with the applicable requirements of this subchapter.

(b) Access and ventilation intakes to the machinery, accommodation and working spaces should be so arranged as to prevent the flow of cargo vapor from the weather deck into such spaces. In this respect openings in the forward or after ends of poops, forecastles, and deckhouses adjacent the cargo area shall be at least 24 inches above the cargo handling deck.

(c) Materials used in the fabrication of cargo tanks and piping shall have adequate notch toughness at the service temperature. Where a secondary barrier is required, the material of that barrier and of contiguous hull structure shall have sufficient notch toughness at the lowest temperature which may result during the containment of leakage cargo within the secondary barrier. Materials used in the fabrication of the cargo containment and handling system shall satisfy the requirements for toughness specified in Subchapter F (Marine Engineering) of this chapter.

(d) Cargo tank spaces are to be isolated from the remainder of the vessel by cofferdams in accordance with Section 32.60–10 of this subchapter. In a nonpressure vessel configuration, the void between the primary and secondary barriers shall not be acceptable as the required cofferdam between the tank spaces and the main machinery spaces.

(e) Compartments containing cargo tanks or pipes shall be accessible from the weather deck only. No openings from these compartments to other parts of the vessel are permitted.

(f) Barges shall comply with the applicable sections of Subpart 32.63 of this subchapter.

(R.S. 4472, as amended, 4488, as amended, 46 U.S.C. 170, 481.)

38.05–2 Design and construction of cargo tanks—general—TB/ALL. (a) The maximum allowable temperature of the cargo is defined as the boiling temperature of the liquid at a pressure equal to the setting of the relief valve.

(b) The service temperature is the minimum temperature at which cargo is loaded and/or transported in the cargo tank. However, the service temperature shall in no case be taken higher than given by the following formula:

$$t_s = t_w - 0.25\ (t_w - t_B) \qquad (1)$$

where:

t_s = Service temperature.
t_w = Boiling temperature of gas at normal working pressure of tank but not higher than +32° F.
t_B = Boiling temperature of gas at atmospheric pressure.

(c) Heat transmission studies, where required, shall assume the minimum ambient temperatures at 0° F. still air and 32° F. still water, and maximum ambient temperatures of 115° F. still air and 90° F. still water.

(d) Cargo tanks in vessels in ocean; Great Lakes; lakes, bays, and sounds; or coastwise service shall be designed to withstand, simultaneously, the following dynamic loadings:

(1) Rolling 30° each side (120°) in 10 seconds.

(2) Pitching 6° half amplitude (24°) in 7 seconds.

(3) Heaving $L/80'$ half amplitude ($L/20'$) in 8 seconds.

(e) Cargo tanks on barges shall be designed in accordance with Section 32.63–25 of this subchapter.

(f) Each liquefied flammable gas tank shall be provided with not less than a 15-inch by 23-inch or an 18-inch nominal diameter manhole fitted with a cover located above the maximum liquid level and as close to the top of the tank as possible. Where access trunks are fitted to the tanks,

the nominal diameter of the trunks shall be not less than 30 inches.

(g) Cargo tanks vented above 10 pounds per square inch gage shall be of the pressure vessel type.

(R.S. 4433, as amended ; 46 U.S.C. 411)

38.05–3 Design and construction of pressure vessel type cargo tanks—TB/ALL. (a) Cargo tanks of pressure vessel configuration (e.g. cylindrical, spherical, etc.) shall be designed, fabricated, inspected, and tested in accordance with the applicable requirements of Part 54 of Subchapter F (Marine Engineering) of this chapter, except as otherwise provided for in this part.

(b) The requirements of this section anticipate that cargo tanks constructed as pressure vessels will, by themselves, constitute the cargo containment system and usually will not require a secondary barrier.

(c) In the design of the tank, consideration shall be given to the possibility of the tank being subjected to external loads. Consideration shall also be given to excessive loads that can be imposed on the tanks by their support due to static and dynamic forces under operating conditions or during testing. The design shall show the manner in which the tanks are to be installed, supported, and secured, and shall be approved prior to tank installation.

(d) Tanks with a service temperature of minus 20° F. or lower and fabricated of ferritic materials shall be stress relieved.

(e) Unlagged cargo tanks, where the cargo is transported, at or near ambient temperatures, shall be designed for the vapor pressure of the gas at 115°F. The design shall also be based on the minimum internal pressure (maximum vacuum), plus the maximum external static head to which the tank may be subjected. Whenever surrounding cargo is at a greater temperature than the maximum allowable temperature of the liquefied flammable gas tanks, the liquefied flammable gas cargo is to be such that the design pressure of the liquefied flammable gas tank is not exceeded.

(f) Where cargo tanks, in which the cargo is transported at or near ambient temperature, are lagged with an insulation material of a thickness to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree Fahrenheit differential in temperature per hour, the tanks shall be designed for a pressure of not less than the vapor pressure of the gas at 105° F. The insulation material shall conform to the requirements of Section 38.05–20. The design shall also be based on the minimum internal pressure (maximum vacuum) plus the maximum external static head to which the tank may be subjected.

(g) Cargo tanks in which the temperature is maintained below the normal atmospheric temperature by refrigeration or other acceptable means shall be designed for a pressure of not less than 110 percent of the vapor pressure corresponding to the temperature of the liquid at which the system is maintained, or the pressure corresponding to the greatest dynamic and static loads expected to be encountered either in service or during testing. For mechanically stress relieved cargo tanks, additional factors relating design pressure and maximum allowable pressure shall be as specified by the Commandant. The material of the tank shall satisfy the requirements of Subchapter F (Marine Engineering) of this chapter for the service temperature, and this temperature shall be permanently marked on the tank as prescribed in Section 38.05–5.

(h) Where applicable, the design shall investigate the thermal stresses induced in the cargo tank at the service temperature.

(i) The shell and head thickness of liquefied gas cargo tanks shall not be less than five-sixteenths inch.

(R.S. 4433, as amended ; 46 U.S.C. 411)

38.05–4 Design and construction of nonpressure vessel type cargo tanks—TB/ALL. (a) The requirements in this section anticipate a cargo containment system consisting of a primary tank which is structurally self-supporting and, where required, a secondary barrier. Other vessel or cargo tank configurations, such as membrane type liners externally supported, will be considered upon submission of substantiating data, and based upon such additional tests as the Commandant may direct.

(b) A secondary barrier is an arrangement or structure designed to contain the cargo temporarily if leakage develops in the primary container. A secondary barrier shall be provided where leakage from the primary container may cause lowering of the temperature of the ship's structure to an unsafe level. The secondary barrier shall be constructed of material suitable to contain the cargo at the service temperature.

(c) The design of the cargo containment systems shall be such that under normal service conditions, or upon failure of the primary tank, the hull structure shall not be cooled down to a temperature which is unsafe for the materials involved. Structural members not suitable for the service temperatures of the cargo shall be protected by a secondary barrier consisting of suitable structural containment together with necessary associated insulation. Heat transmission studies and tests may be required to demonstrate that the arrangement is feasible and that the final material temperatures are acceptable.

(d) The design and construction of the cargo tanks shall be at least equivalent to the standards established by the American Bureau of Shipping or other recognized classification society. For special tanks, or designs not contemplated by stand-

ards of the classification society, a detailed analysis of the entire tank, or designated parts thereof, shall be made and submitted to the Commandant for approval.

(e) The cargo tank shall be designed for a head of cargo at least equal to the highest level the liquid cargo may attain plus the maximum venting pressure. In no case shall a head of cargo less than 4 feet above the cargo hatch or expansion trunk be used.

(f) The design shall investigate the thermal stresses induced in the cargo tank during loading. Where necessary devices for spray loading or other methods of precooling or cooling during loading shall be included in the design.

(g) All weld intersections or crossings in joints of primary tank shells shall be radiographed for a distance of 10 thicknesses from the intersection. All other welding in the primary tank and in the secondary barrier shall be spot radiographed in accordance with the requirements of Part 54 of Subchapter F (Marine Engineering) of this chapter.

(R.S. 4433, as amended ; 46 U.S.C. 411)

38.05–5 Markings—TB/ALL. (a) (1) Upon satisfactory completion of tests and inspection, pressure vessel and nonpressure vessel type cargo tanks, shall have markings as required by Section 54.10–20 of Subchapter F (Marine Engineering) of this chapter except that for nonpressure vessel type tanks, the Coast Guard number and pressure vessel class shall be omitted.

(2) Hydrostatic test for pressure vessel type tanks shall be that specified in Paragraph 38.25–1(b). In the case of nonpressure vessel type tanks, the hydrostatic test pressure shall mean the pressure specified in Paragraph 38.25–1(d), while the maximum allowable pressure shall mean the maximum venting pressure as used in Paragraph 38.05–4(e). Where it is not feasible to attach the nameplate to the tank, it shall be conspicuously displayed nearby.

(b) All tank inlet and outlet connections, except safety relief valves, liquid level gaging devices, and pressure gages, shall be labeled to designate whether they terminate in the vapor or liquid space. Labels of corrosion-resistant material may be attached to valves.

(c) All tank markings shall be permanently and legibly stamped in a readily visible position, and shall not be obscured by painting. If the tanks are lagged, the markings attached to the tank proper shall be duplicated on a corrosion-resistant plate secured to the outside jacket of the lagging.

38.05–10 Installation of cargo tanks—general—TB/ALL. (a) (1) Cargo tanks shall be supported on foundations of steel or other suitable material and securely anchored in place to prevent the tanks from shifting when subjected to external forces. Each tank shall be so supported as to prevent the concentration of excessive loads on the supporting portions of the shell or head as prescribed under Paragraph 38.05–2(d).

(2) Cargo tanks installed in barges shall comply with the requirements of Section 32.63–25 of this subchapter.

(b) Foundations, and stays where required, shall be designed for support and constraint of the weight of the full tank, and the dynamic loads imposed thereon. Thermal movement shall also be considered.

(c) Foundations and stays which may be exposed to the cargo shall be suitable for the temperatures involved and be impervious to the cargo.

(d) The design of the foundations and stays shall consider the resonance of the cargo tank, or parts thereof, and the vibratory forces found in the tank vessel. If necessary, effective damping arrangements shall be provided.

(e) Independent containment systems shall be so arranged as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom to provide access for inspection of the hull. Clearances for collision protection, where required by other parts of the regulations in this subchapter, may increase the clearances specified here.

(1) For pressure vessel type tanks the distance between adjacent tanks and between tanks and vessel's structure shall be adequate to permit access for inspection and maintenance of all tank surfaces and hull structure as approved by the Commandant. Alternate provisions may be made for inspection and maintenance of the vessel's structure and tanks by moving such tanks or by providing equivalent acceptable means for remote inspection.

(2) For nonpressure vessel type containment systems, access shall be arranged to permit inspection of one side each of the primary tank and secondary barrier, under normal shipyard conditions. Containment systems which, because of their peculiar design, cannot be visually inspected to this degree, may be specially considered provided an equivalent degree of safety is attained.

(f) Cargo tanks may be installed "on deck," "under deck," or with the tanks protruding through the deck. All tanks shall be installed with the manhole openings located in the open above the weather deck. Provided an equivalent degree of safety is attained, the Commandant may approve cargo tanks installed with manhole openings located below the weather deck.

(g) For pressure vessel type cargo tanks, the following conditions apply:

(1) Liquefied flammable gas cargo tanks may be located in cargo tanks or in spaces which meet the requirements for cofferdams as defined in Section 30.10–13 of this subchapter. When liquefied

flammable gas cargo tanks are installed in cargo tanks, such cargo tanks may be used simultaneously or separately for the carriage of flammable or combustible liquids up to and including the grade for which the cargo tanks are otherwise certified in accordance with the requirements of this subchapter.

(2) Where the liquefied flammable gas tanks are installed in cargo tanks and a portion of the liquefied flammable gas tanks extend above the weather deck, the penetration shall be made gastight and watertight, and shall be such as to provide full compliance with the structural requirements including testing for the hull and integral tanks. In the application of the requirements for the hydrostatic test of the cargo tanks, the hydrostatic test shall in no case be less severe than the worst anticipated service condition of the cargo loading. In the design and testing of independent cargo tanks and integral cargo tanks consideration shall be given to the possibility of the independent tanks being subjected to external loads.

(3) Where the liquefied flammable gas tanks are installed in nontank hull spaces and a portion of the tank extends above the weather deck, provision shall be made to maintain the weathertightness of the deck, except that the weathertightness of the upper deck need not be maintained on:

(i) Vessels operating on restricted routes which are sufficiently protected; or,

(ii) Open hopper type barges of acceptable design.

(h) No strength welding employed in the attachment of supports, lugs, fittings, etc., shall be done on tanks that require and have been stress relieved, unless authorized by the Commandant.

(R.S. 4433, as amended, 4488, as amended; 46 U.S.C. 411, 481.)

38.05-20 Insulation—TB/ALL. (a) Where used, tank insulation shall satisfy the following requirements for combustibility, installation, and arrangement:

(1) Insulation in a location exposed to possible high temperature or source of ignition shall be either:

(i) Incombustible, complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter; or,

(ii) Self-extinguishing, as determined by American Society for Testing and Materials Specification D-1692, "Flammability of Plastics, Foam and Sheeting," and covered by a suitable steel cover.

(2) Insulation in a location protected against possible ignition by enclosure in a tight steel envelope in which inert conditions are maintained need satisfy no requirement for combustibility except chemical stability.

(3) Insulation in a location protected against possible high temperature or source of ignition by continuous surrounding structural voids or ballast tanks need satisfy no requirement for combustibility except chemical stability.

(b) All insulation shall be of a vapor-proof construction, or have a vapor-proof coating of a fire-retardant material acceptable to the Commandant. Unless the vapor barrier is inherently weather resistant, tanks exposed to the weather shall be fitted with a removable sheet metal jacket of not less than 0.083-inch thick over the vapor-proof coating and flashed around all openings so as to be weathertight. Weather resistant coatings shall have sheet metal over areas subject to mechanical damage.

(c) The insulation shall be adequately protected in areas of probable mechanical damage.

(d) Insulation which forms an integral part of the secondary barrier shall meet the following additional requirements:

(1) When the secondary barrier is called upon to contain the cargo, insulating material which is contacted shall not be affected by the cargo. Samples of the insulating material shall be tested in the cargo for solubility, absorption and shrinkage. The samples shall be checked for the above effects at intervals not exceeding 1 week, for a total test period of 6 weeks.

(2) Any adhesives, sealers, coatings, or vapor barrier compounds used in conjunction with the insulating material shall be similarly tested to insure suitable cargo resistive properties.

(3) The insulation shall have sufficient mechanical strength for the proposed design. Additionally, the thermal expansion of the insulation relative to the material to which it is affixed shall be considered in the design.

(e) The insulation for the piping systems shall be at least of the "self-extinguishing" type described in paragraph (a) of this section, and comply with the requirements contained in paragraphs (b) and (c) of this section.

38.05-25 Refrigerated systems—TB/ALL. (a) When a liquefied flammable gas is carried below atmospheric temperature under the requirements of Paragraph 38.05-3(f) or Section 38.05-4, maintenance of the tank pressure below the maximum allowable pressure shall be provided by one or more of the following means:

(1) A refrigeration or liquefication system which regulates the pressure in the tanks. A standby compressor or equivalent equipment, of a capacity equal to one of the working units shall be provided.

(2) A system whereby the vapors are utilized as fuel for shipboard use.

(3) A system allowing the liquefied flammable gas to warm up and increase in pressure. The insulation and tank design pressure shall be adequate to provide for a suitable margin for the operating time and temperatures involved.

(4) Other systems acceptable to the Commandant.

(b) A system whereby the vapors are vented to the atmosphere at sea only may be employed in conjunction with paragraph (a)(1) of this section. The pressure control valves shall be independent of the safety relief valves. See Paragraph 38.20-1(j).

SUBPART 38.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

AUTHORITY Note: The provisions of this Subpart 38.10 also issued under R.S. 4433, as amended, 4488, as amended; 46 U.S.C. 411, 481.

38.10-1 Valves, fittings, and accessories—TB/ALL. (a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with liquefied flammable gases, and shall be made of steel or grade A malleable iron, acceptable for the service temperature and pressure according to the requirements of Part 56 of Subchapter F (Marine Engineering) of this chapter. Other materials may be specially considered and approved by the Commandant.

(b) All valves, flanges, fittings, and accessory equipment shall have a pressure rating at operating temperatures not less than the maximum allowable pressure to which they may be subjected. Piping which is not protected by a relief valve or which can be isolated from its relief valve by other valves shall be designed for the greatest of the cargo vapor pressure at 115° F., or the maximum allowable pressure of the cargo tank, or the requirements of Paragraph 38.10-10(a). Cargo liquid piping which may be subject to liquid full conditions shall be fitted with relief valves. The escape from piping systems relief valves shall be piped to a venting system or to a suitable vapor recovery system. Provision shall be made for the proper venting of all valves, fittings, etc., in which pressure buildup may occur, especially in refrigerated systems, because of an increase in product temperature.

(c) Welded connections shall be used wherever possible with the number of flanged joints kept to the minimum necessary for assembly and cleaning. Sockets in sizes 3 inches and smaller and slipon flanges in sizes 4 inches and smaller may be used. Threaded joints may be used in sizes of 1 inch and smaller. Where threaded joints are used, they shall be visible and accessible for inspection under all service conditions, and limited to instrument and control lines properly valved from the main lines. Where threaded joints are sealed by brazing or welding, they need not be exposed.

(d) Valve seat material, packing, gaskets, etc., shall be resistant to the action of the liquefied flammable gas. All flange and manhole cover gaskets shall be compressed asbestos, spiral-wound metal asbestos, metal jacketed asbestos, solid aluminum, corrugated steel, solid steel, or iron, or other materials with equal or better resistance to fire exposure.

(e) Provisions shall be made by the use of offsets, loops, bands, expansion joints, etc., to protect the piping and tank from excessive stress due to thermal movement and/or movements of the tank and hull structure. Expansion joints shall be held to a minimum and where used shall be of the bellows type and subject to special approval by the Commandant.

(f) Low temperature piping shall be thermally isolated from the hull structure. Arrangements should provide for the protection of the hull structure from leaks in way of pumps, flanges, joints, etc.

(g) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valve connections, refrigeration connections where necessary, liquid level gaging devices, thermometer well and pressure gage, and shall be provided with suitable access for convenient operation. Piping shall enter the cargo tanks above weather deck and as close to the top of the tank or dome as possible, except as otherwise permitted in this section. Connections to the tanks shall be protected against mechanical damage and tampering. No underdeck cargo piping shall be installed between the outboard side of the cargo containment system and the shell of the vessel, unless provision is made to maintain the minimum inspection and collision protection clearances of Paragraph 38.05-10(e) between the piping and the shell. Other openings in the tanks, except as specifically permitted by the Commandant, are prohibited.

(h) Cargo loading and discharge piping may be connected to the tanks below the weather deck or below the liquid level subject to approval by the Commandant, provided:

(1) A remotely controlled quick-closing shutoff valve is flanged to the tank outlet connection. The control mechanism for this valve shall meet the requirements of Section 38.10-5.

(2) The piping which is below the weather deck or liquid level shall be joined by welding except for a flanged connection to the quick-closing shutoff valve and a flanged connection to the cargo pump.

(3) The design and arrangement of this piping, including the flange bolting shall be such that excessive stresses will not be transmitted to the cargo tank outlet connection or the quick-closing valve, even in the event of abnormal displacement of the piping.

(4) Except for those vessels, the design of which permits the exclusion of a weathertight deck over the tanks, the space in which such piping is located shall be accessible only from the weather deck and shall be vented to a safe location above the weather deck.

(i) All connections to tanks, except safety relief valves and liquid level gaging devices, shall have manually operated shutoff valves located as close to the tank as possible. In addition, all liquid and

vapor connections on pressure vessel type tanks except safety relief valves, liquid level gaging devices, and filling and discharge lines, shall be equipped with either an automatic excess flow valve or a remotely controlled quick-closing shutoff valve of the fail closed type. These valves, except when necessary for the operation of the system, shall remain closed. For pressure vessel type tanks operating at low pressure and with service temperature near the cargo atmospheric boiling point, the Commandant may approve individual installations where the liquid and vapor connections normally requiring automatic excess flow valves or remotely controlled quick-closing shutoff valves are fitted with manually operated shutoff valves only.

(j) The control system for quick-closing shutoff valves shall be provided with a remote control in at least two locations and be of a type acceptable to the Commandant. The control system shall also be provided with a fusible element designed to melt between 208° F. and 220° F., which will cause the quick-closing shutoff valves to close in case of fire. The quick-closing shutoff valves shall be capable of local manual operation.

(k) Excess flow valves, where required by this subchapter shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, including valves, fittings, and appurtenances protected by an excess flow valve, shall have a greater capacity than the rated flow of the excess flow valve.

(l) Liquid level gaging devices which are so constructed that outward flow of tank contents shall not exceed that passed by a No. 54 drill size (0.055-inch diameter) opening, need not be equipped with excess flow valves.

(m) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size (0.055-inch diameter).

(n) Excess flow valves may be designed with a bypass not to exceed a No. 60 drill size (0.040-inch diameter) opening to allow equalization of pressure.

(o) Suitable valves shall be installed on the cargo headers to relieve the pressure in the liquid and vapor lines to a safe location prior to disconnecting shore lines.

(p) A pressure gage shall be located at the highest practicable point. A thermometer well where installed on the tank proper shall be attached to the tank by welding.

(q) For nonpressure vessel type tanks, the following additional fittings are required:

(1) A liquid level gaging device shall be provided to determine the level of the liquid cargo without opening the tank. The gage shall be readable from the open deck, or from a control room or station when the loading or discharging is controlled from such a room or station. Tables shall be readily available for direct determination of volume of liquid in the tanks, with necessary corrections for trim, temperature, and density.

(2) An independent high level alarm shall be provided for each tank. The alarm indication shall register at the station where loading is controlled.

(3) Each tank shall be provided with remote reading temperature sensors located near both the cargo liquid level and the bottom of the tank. The temperature shall be read at the control station for loading and unloading cargo, if provided, otherwise near the cargo control valves.

(4) Each tank shall be fitted with a pressure and a vacuum gage which shall be read at the control station for loading and unloading cargo, if provided, otherwise near the cargo control valves. In addition, the liquid loading and discharge headers at the ship's shore connection station shall be fitted with pressure gages.

(r) Spaces surrounding cargo tanks shall be provided with suitable means for pumping out.

(1) Where pressure vessel type tanks are installed or in other cases where no secondary containment is required, this may consist of a bilge system independent of the bilge system for the rest of the vessel, and having no pipe connections between the cargo tank spaces and the engineroom or boilerroom, except that eductors may be supplied from engineroom pumps.

(2) Secondary containment spaces of structurally self-supporting tanks shall be provided with suitable means for pumping out leaked cargo. These should be arranged so as to provide the following alternatives:

(i) Return of the cargo to the same primary tank or other tank.

(ii) Pumping the cargo off the ship either in port through a regular shore unloading connection or at sea overboard in a safe manner.

38.10–5 Filling and discharge pipes—TB/ALL. (a) Filling and discharge connections shall be provided with the manually operated valve required by Section 38.10–1(i) and with a positive acting remote controlled quick-closing valve. The remote controlled quick-closing valve shall satisfy the requirements of Section 38.10–1(j).

(b) For pressure vessel type tanks the remote controlled quick-closing valves shall be located on the inside of the tank or on the outside where the piping enters the tank. For pressure vessel type tanks operating at low pressure and with service temperature near the cargo atmospheric boiling point, the Commandant may approve individual installations where these valves are located at the loading and discharge headers.

(c) For nonpressure vessel type tanks the remote controlled quick-closing valves may be located at the loading and discharge headers.

38.10–10 Cargo piping—TB/ALL. (a) The piping shall be designed for a working pressure of not less than the maximum pressure to which it may be subjected but in no case less than the design pressure of the cargo tanks. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall not be less than the pump or compressor discharge relief valve setting; or, provided the piping is not protected by relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(b) Piping subject to tank pressure shall be seamless drawn steel or electric resistance welded steel. Pipe used in refrigerated tank systems shall be of a material which is suitable for the minimum service temperature to which it may be subjected, according to the requirements of Part 56 of Subchapter F (Marine Engineering) of this chapter.

(c) Piping shall be provided with adequate support to take the weight of the piping off valves and fittings and to prevent excessive vibration and stresses on tank connections.

(d) For nonpressure vessel type tanks, the cargo handling arrangements and piping shall provide for emptying of a damaged tank, including cargo contained by a secondary barrier.

38.10–15 Safety relief valves—TB/ALL. (a) Each tank shall be fitted with or (subject to approval by the Commandant) connected to one or more safety relief valves designed, constructed and flow tested for capacity in conformance with Subpart 162.017 or 162.018 of Subchapter Q (Specifications) of this chapter.

(b) Safety relief valves conforming to Subpart 162.017 of Subchapter Q (Specifications) of this chapter may be used on tanks for a maximum pressure of 10 pounds per square inch gage. Safety relief valves conforming to Subpart 162.018 of Subchapter Q (Specifications) of this chapter may be used for any pressure.

(c) The safety relief valves shall have a combined relieving capacity to discharge the greater of the following with not more than 20 percent rise in pressure (in the tank) above the maximum allowable pressure:

(1) The vapors evaporated by an ambient air temperature of 115° F. plus the maximum flow rate of the cargo filling pipes or,

(2) The vapors generated under fire exposure computed using the formulas of Section 54.15–25(c) of Subchapter F (Marine Engineering) of this chapter.

(d) The safety relief valves shall meet the arrangement and inspection requirements of Section 54.15–25 of Subchapter F (Marine Engineering) of this chapter.

(e) Means shall be provided to protect nonpressure vessel tanks from excessive external pressure.

(f) Void spaces between the primary and secondary barriers of nonpressure vessel type tanks shall be protected by relief devices. The relief setting shall not be higher than the void test pressure, and shall not exceed 90 percent of the setting of the safety relief valve protecting the primary tank.

38.10–16 (Canceled)

38.10–20 Liquid level gaging devices—TB/ALL. (a) Each tank shall be fitted with a liquid level gaging device of approved design to indicate the maximum level to which the tank may be filled with liquid:

(1) between −20° F. and 130° F. for unrefrigerated service; or,

(2) Within the operating temperature range for tanks operating below atmospheric temperature.

(b) Liquid level gaging devices may be of the following types: Rotary tube, slip tube, magnetic, automatic float, or similar types approved by the Commandant. Except as otherwise provided in this section, fixed tube devices are not acceptable as the primary gaging device.

(c) All gaging devices shall be arranged so that the maximum liquid level for product being carried, to which the tank may be filled is readily determinable. The maximum gallonage capacity as required by Section 38.15–1 shall be:

(1) Marked on the tank system nameplate or gaging device; or,

(2) Shown in the ullage tables.

(d) Gaging devices that require bleeding of the product to the atmosphere, such as the rotary tube, fixed tube, and slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size (0.055-inch diameter), unless provided with an excess flow valve.

(e) For pressure vessel type tanks each automatic float, continuous reading tape or similar type gage not mounted directly on the tank or dome shall be fitted with a shutoff device located as close to the tank as practicable. When an automatic float gaging device, which gages the entire height of the tank is used, a fixed tube gage set in the range of 85 percent to 90 percent of the water capacity of the tank shall be provided in addition as a means of checking the accuracy of the automatic float gage, or other alternate means acceptable to the Commandant may be used.

(f) A gaging device shall be designed for a pressure at least equal to the maximum allowable pressure of the tank on which it is installed.

(g) Gage glasses of the columnar type are prohibited.

(h) Flat sight glasses may be used in the design of automatic float continuous reading tape gages: *Provided*, That such glasses shall be made of high strength material suitable for the operating temperatures of not less than one-half inch in thickness and adequately protected by a metal cover.

SUBPART 38.15—SPECIAL REQUIREMENTS

38.15-1 Filling of tanks—TB/ALL. (a) Refrigerated and semirefrigerated tanks shall be filled so that there is an outage of at least 2 percent of the volume of the tank at the temperature corresponding to the vapor pressure of the cargo at the safety relief valve setting. A reduction in the required outage may be permitted by the Commandant when warranted by special design considerations. Normally then, the maximum volume to which a tank may be loaded is:

$$V_L = \frac{0.98 d_r V}{d_L} \quad (1)$$

where:

V_l = maximum volume to which tank may be loaded.
V = Volume of tank.
d_r = density of cargo at the temperature required for a cargo vapor pressure equal to the relief valve setting.
d_L = density of cargo at the loading temperaure and pressure.

(b) Nonrefrigerated tanks shall be filled so that their filling densities shall not exceed the ratios indicated in Table 38.15-1(b).

TABLE 38.15-1(b)—MAXIMUM PERMISSIBLE FILLING DENSITIES FOR TANKS OPERATING AT OR NEAR AMBIENT TEMPERATURE

Specific gravity at 60° F.	Maximum permitted filling density		
	Unlagged tanks—water capacity		Lagged tanks—all capacities
	1,200 gal. and under	Over 1,200 gal.	
0.473–0.480	38	41	42
0.481–0.488	39	42	43
0.489–0.495	40	43	44
0.496–0.503	41	44	45
0.504–0.510	42	45	46
0.511–0.519	43	46	47
0.520–0.527	44	47	48
0.528–0.536	45	48	49
0.537–0.544	46	49	50
0.545–0.552	47	50	51
0.553–0.560	48	51	52
0.561–0.568	49	52	53
0.569–0.576	50	53	54
0.577–0.584	51	54	55
0.585–0.592	52	55	56
0.593–0.600	53	56	57
0.601–0.608	54	57	58
0.609–0.617	55	58	59
0.618–0.626	56	59	60
0.627–0.634	57	60	61

NOTE: Increase in filling densities to provide for seasonal changes may be considered by the Commandant upon presentation of factual evidence that safe operation can be effected.

(c) The "filling density" is defined as the percent ratio of the weight of the gas in a tank to the weight of water the tank will hold at 60° F.

38.15-5 Cargo hose—TB/ALL. (a) When the liquid and vapor line hoses used for loading and discharging the cargo are carried on board the vessel, they shall be of flexible metal and fabricated of seamless steel pipe and flexible joints of steel or bronze, or of other suitable material resistant to the action of the cargo. Hose used in refrigerated systems shall be suitable for the minimum temperature to which it may be subjected and shall be acceptable to the Commandant.

(b) Hose subject to tank pressure, or the discharge pressure of pumps or vapor compressors, shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank, pump, or compressor.

(c) Before being placed in service each new cargo hose, with all necessary fittings attached, shall be hydrostatically tested by its manufacturer to a pressure not less than twice its maximum working pressure nor more than two-fifths its bursting pressure. The hose shall be marked with its maximum working pressure, and if used in refrigerated service, its minimum temperature.

38.15-10 Leak detection systems—T/ALL. (a) A detection system shall be permanently installed to sense cargo leaks. The detectors shall be located within the space so as to permit the sensing of an initial leak and prevent an undetected gas accumulation. The sensitivity shall be in accordance with paragraph (b) of this section. The detectors shall be fitted in the following compartments:

(1) Between the primary and secondary barriers for nonpressure vessel type tanks.

(2) Cargo handling rooms and spaces containing cargo piping or cargo handling systems.

(3) All enclosed spaces, except tanks and cofferdams, which are separated from the cargo tanks by only the secondary barrier.

(4) Other spaces where gas concentrations might be expected.

(5) Cargo holds, containing pressure vessel type tanks and no cargo piping, are exempt from the requirements of this paragraph.

(b) The indicating instruments for the detection system shall be located on the bridge or at the cargo control station. An audio and visual warning shall be given before any gas concentration reaches 30 percent of the lower explosive limit. The alarm shall indicate both on the bridge and at the cargo control station. Sampling of each detector shall be at least once every half hour.

(c) Means shall be provided to measure the full range of cargo gas concentration in the spaces.

38.15-15 Electrical installations—TB/ALL. (a) All electrical installations shall comply with the requirements contained in this subchapter and in Subchapter J (Electrical Engineering) of this chapter for tank vessels, except as otherwise specified in this part.

(b) Spaces containing cargo pumps, compressors, and piping are considered as equivalent to a tank vessel pumproom, and no electrical devices, except Coast Guard approved intrinsically safe

devices, shall be installed in these spaces. Electric motors shall be segregated from these spaces by a gastight bulkhead. Electric lighting of the explosion-proof type may be installed in these spaces provided all switching is done from outside the space.

(c) All cargo tanks, piping, valves, etc., shall be effectively grounded to the vessel's hull. Tanks with an insulated inner shell (primary barrier) shall have an effective grounding bond to the outer shell (secondary barrier) or to the vessel's hull.

(d) Electric submerged motor cargo pumps may be used, when in compliance with the following requirements and subject to approval by the Commandant.

(1) Design details of the submerged motor pump, with an evaluation of the cooling efficiency of the product being pumped, shall be submitted.

(2) Provisions shall be made to exclude air from the tanks containing cargo in either vapor or liquid phase. The pump motor shall be deenergized when this condition is not satisfied.

(3) A liquid level sensing device shall automatically shut down the motor and sound an alarm at a predetermined low liquid level. The alarm location may be the station from which cargo handling is controlled or such other location outside the cargo area as is acceptable to the Commandant.

(4) Details of the power cable, tank penetrations and pump connections shall be submitted.

(5) An auxiliary means of emptying the cargo tanks shall be provided in accordance with Paragraph 38.10-10(d).

(6) Means for positively disconnecting the power supply between the switchboard and the pump power panel shall be provided, i.e., disconnect links, lockable breakers, etc.

(7) All materials used in the fabrication of the submerged motor cargo pumps shall be suitable for use with the liquid cargo at the design pressures and temperatures.

38.15-20 Remote shutdowns—TB/ALL. (a) All machinery associated with cargo loading, unloading, or cooling shall be capable of being shut down from a remote location. This location may be the station from which the cargo handling is controlled or such other location outside the cargo area as is acceptable to the Commandant.

SUBPART 38.20—VENTING AND VENTILATION

38.20-1 Venting—T/ALL. (a) Each safety relief valve installed on a cargo tank shall be connected to a branch vent of a venting system which shall be constructed so that the discharge of gas will be directed vertically upward to a point which shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and to a minimum of at least 10 feet, and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of vapor ignition. When special conditions will prevent the vent line header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height of one-third the beam of the vessel.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header as provided for in the Table 38.20-1(b), and upon the total safety relief valve discharge capacity.

Table 38.20-1(b)—Capacity of Branch Vents or Vent Headers

Number of cargo tanks:	*Percent of total valve discharge*
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting. In nonpressure vessel vent systems, however, where the maximum back pressure of 10 percent of the relief valve setting is insufficient to move the gases through any but an extremely large diameter vent pipe, the back pressure may exceed 10 percent provided:

(1) The pressure in the tank during venting does not exceed 120 percent of the tank maximum allowable pressure; and,

(2) The safety relief valve is sized to discharge the required capacity with the tank pressure and vent back pressure actually used.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical injury and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow.

(g) No valve of any type shall be fitted in the vent pipe between the safety relief valve and the vent outlets.

(h) Provisions shall be made to drain condensate from the vent header piping. Special precautions shall insure that condensate does not accumulate at or near the relief valves.

(i) Relief valves discharging liquid cargo shall not be connected to the branch vent or vent header lines from the cargo tanks. They may, however,

be connected to an accumulator, the vapor space of which, may in turn, be connected to the vent header system. Relief valves in the cargo piping system may discharge back to the cargo tanks.

(j) Vapor discharged to the atmosphere in accordance with Paragraph 38.05-25(b) shall utilize valves separate from the safety relief valves.

38.20-5 Venting—B/ALL. (a) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a reasonable height above the deck. An alternate arrangement consisting of a branch vent header system as required by Section 38.20-1 may be installed. In any case, the provisions of Paragraph 38.20-1 (d) through (j) shall apply.

(b) Arrangements providing for venting cargo tanks at sea on unmanned barges will be considered by the Commandant upon presentation of plans.

38.20-10 Ventilation—T/ALL. (a) A power ventilation system shall be provided for compartments containing pumps, compressors, pipes, control spaces, etc. connected with the cargo handling facilities. These compartments shall be ventilated in such a way as to remove vapors from points near the floor level or bilges, or other areas where vapor concentrations may be expected. The compartments shall be equipped with power ventilation of the exhaust type having capacity sufficient to effect a complete change of air in not more than 3 minutes equal to the volume of the compartment and associated trunks.

(b) The power ventilation units shall not produce a source of vapor ignition in either the compartment or the ventilation system associated with the compartment. Inlets to exhaust ducts shall be provided and located at points where concentrations of vapors may be expected. Ventilation from the weather deck shall be provided. Ventilation outlets shall terminate away from any openings to the interior part of the vessel a lateral distance at least equal to that specified in Paragraph 38.20-1(a). These outlets shall be so located as to minimize the possibility of recirculating contaminated air through the compartment.

(c) Means shall be provided for purging the following spaces of cargo vapors:

(1) The space surrounding nonpressure vessel type tanks, i.e., within the secondary barrier.

(2) The space surrounding pressure vessel type tanks whose piping connections are below the weather deck in accordance with Paragraph 38.10-1(h).

(3) The space surrounding tanks whose manhole openings are below the weather deck in accordance with Paragraph 38.05-10(f).

(d) Power ventilation shall be provided for each auxiliary machinery or working space located on and accessible from the cargo handling deck. Such ventilation systems shall be designed to preclude the entry of cargo vapors into the space via the open access or the ventilation system itself.

SUBPART 38.25—PERIODIC TESTS AND INSPECTIONS

38.25-1 Tests and inspections—TB/ALL. (a) Each tank shall be subjected to the tests and inspections described in this section in the presence of a marine inspector, except as otherwise provided in this part.

(1) An internal examination shall be made at least once in each 8 calendar years.

(2) An external examination of unlagged tanks and the visible parts of lagged tanks shall be made at each inspection for certification and at such other times as considered necessary.

(3) To the extent, and if, deemed necessary by the marine inspector sufficient insulation shall be removed from insulated tanks at least once in each 8 calendar years to permit spot external examination of the tanks and insulation. The marine inspector may require that the thickness of the tanks be gaged by an acceptable nondestructive means without additional removal of insulation.

(b) A hydrostatic test of 1½ times the maximum allowable pressure, as determined by the safety relief valve setting, shall be made at any time that the marine inspector considers such hydrostatic test necessary to determine the condition of the tank. In the case of cargo tanks operating at maximum allowable pressures reduced below the design pressure in order to satisfy special mechanical stress relief requirements, the hydrostatic test pressure shall be 1½ times the maximum allowable pressure times the factor (due to mechanical stress relief) of design pressure divided by maximum allowable pressure.

(c) For pressure vessels designed and/or supported such that they cannot safely be filled with water, the Commandant will consider a pneumatic test in lieu of the hydrostatic test. A leak test, shall be performed in conjunction with the pneumatic test. Pneumatic testing shall be in accordance with Subchapter F (Marine Engineering) of this chapter.

(d) Nonpressure vessel type tanks shall be tested to a pressure equal to the pressure on the bottom of the tank under the design conditions listed in Paragraph 38.05-4(e).

(e) In the application of the requirements for testing of the cargo tanks, the test shall in no case be less severe than the worst anticipated service condition of the cargo loading.

(f) In the design and testing of the independent cargo tanks, consideration shall be given to the pos-

sibility of the independent tanks being subjected to external loads.

38.25–5 Removal of defective tanks—TB/ALL. If a tank fails to pass the tests prescribed in this subpart, it shall be removed from service unless otherwise authorized by the Commandant.

38.25–10 Safety relief valves—TB/ALL. (a) The cargo tank safety relief valves shall be inspected at least once in every 2 years.

(b) The safety relief valve discs shall be lifted from their seats in the presence of a marine inspector by either liquid, gas, or vapor pressure at least once every 4 years to determine the accuracy of adjustment and, if necessary, shall be reset.

PART 39—FLAMMABLE OR COMBUSTIBLE LIQUIDS HAVING LETHAL CHARACTERISTICS

SUBPART 39.01—GENERAL

Sec.
39.01-1 Scope of regulations—TB/ALL.
39.01-5 Certificate of inspection—TB/ALL.

SUBPART 39.05—DESIGN, ARRANGEMENT, AND INSTALLATION OF CARGO TANKS

39.05-1 Design, construction, and arrangement—TB/ALL.
39.05-5 Markings—TB/ALL.
39.05-10 Installation—TB/ALL.

SUBPART 39.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

39.10-1 Valves and accessories—TB/ALL.
39.10-5 Piping and fittings—TB/ALL.
39.10-10 Safety relief and pressure-vacuum relief valves—TB/ALL.
39.10-15 Gaging devices—TB/ALL.

SUBPART 39.15—SPECIAL CARGO HANDLING REQUIREMENTS

39.15-1 Warning sign at gangway—TB/ALL.
39.15-5 Cargo discharge—TB/ALL.
39.15-10 Pumproom controls—TB/ALL.

SUBPART 39.20—VENTING AND VENTILATION

39.20-1 Venting—T/ALL.
39.20-2 Venting—B/ALL.
39.20-5 Ventilation—TB/ALL.

SUBPART 39.25—PERIODIC INSPECTIONS AND TESTS

39.25-1 Hydrostatic tests and inspection—TB/ALL.
39.25-5 Removal of defective tanks—TB/ALL.
39.25-10 Safety valves—TB/ALL.

AUTHORITY: The provisions of this Part 39 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). R.S. 4472, as amended, 4488, as amended, sec. 3, 68 Stat. 675; 46 U.S.C. 170, 481, 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SUBPART 39.01—GENERAL

39.01-1 Scope of regulations—TB/ALL. (a) The regulations in this part contain requirements for the transportation of flammable or combustible liquids having lethal characteristics and defined as Class "B" or "C" poisons in Sections 146.25-10 and 146.25-15 of Part 146 of Subchapter N (Dangerous Cargoes) of this chapter. The regulations covering the transportation in portable tanks of flammable or combustible liquids having lethal characteristics and defined as Class "B" or "C" poisons are contained in Part 146 of Subchapter N (Dangerous Cargoes) of this chapter.

39.01-5 Certificate of inspection—TB/ALL. (a) Certificate of inspection shall be endorsed for the carriage of Class "B" or "C" poisonous liquids, as follows:

Inspected and approved for the carriage of flammable or combustible Class "B" or "C" poisonous liquids.

(R.S. 4421, as amended; 46 U.S.C. 399)

SUBPART 39.05—DESIGN, ARRANGEMENT, AND INSTALLATION OF CARGO TANKS

39.05-1 Design, construction, and arrangement—TB/ALL. (a) Cargo having a Reid vapor pressure not exceeding 14 pounds per square inch may be transported in tanks, cylindrical or rectangular, independent of the vessel's hull structure, or in tanks built integral with the vessel's hull and completely separated from the shell of the vessel by means of wing tanks, cofferdams, double bottoms or similar voids.

(b) Independent tanks shall be designed for a head of at least 8 feet above the top of the tank or the highest level the product may rise, whichever is the greater, using the specific gravity of the product to be carried. In general, plate less than $\frac{5}{16}$ inch in thickness shall not be used in the fabrication of independent tanks unless otherwise approved by the Commandant.

(c) Tanks built integral with the vessel's hull shall conform with the scantling requirements of the American Bureau of Shipping.

(d) (1) Cargo tanks transporting liquids having a Reid vapor pressure exceeding 14 pounds per square inch, or vented at a gage pressure exceeding 4 pounds per square inch, or where air or water pressure is used to discharge the cargo, shall be fabricated as an arc-welded pressure vessel and meet the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(2) Unfired pressure vessel cargo tanks shall be designed for a pressure of not less than the vapor pressure, in pounds per square inch gage, of the lading at 115° F., or the maximum air or water pressure used in discharging cargo, whichever is greater, but in no case shall the design pressure of such tanks be less than 30 pounds per square inch.

(3) The plate thickness of unfired pressure vessel type cargo tanks shall be not less than $\frac{5}{16}$ inch. Dished heads shall be used in the design of the tanks.

(e) Each tank shall be provided with not less than a 15-inch by 18-inch or an 18-inch diameter manhole, fitted with a cover and located as close

as possible to the top of the tank. Where access trunks are fitted, the diameter or minimum dimension of the trunk shall be not less than 30 inches.

(R.S. 4433, as amended; 46 U.S.C. 411)

39.05–5 Markings—TB/ALL. (a) Upon satisfactory completion of tests and inspection, pressure vessel tanks shall have markings as required by Section 54.10–20 of Subchapter F (Marine Engineering) of this chapter.

(b) In addition to the aforementioned markings, the following inscription shall be stamped on the tank, or a corrosion-resistant plate containing this data shall be securely attached thereto:

This tank shall not contain a product having a vapor pressure in excess of _____ p. s. i. gage at 115° F.

(c) All tank markings shall be permanently and legibly stamped in a readily visible position, and shall not be obscured by painting.

39.05–10 Installation—TB/ALL. (a) Cargo tanks independent of the hull shall be installed with a clearance of not less than 24 inches from the vessel's sides. A working space of not less than 15 inches shall be provided around and under each tank, or provision shall be made for moving the tanks to secure adequate clearance for inspection and maintenance.

(b) Independent tanks shall be mounted on substantial steel saddles securely held down and chocked. Tank saddles shall be designed so as to minimize the concentration of excessive loads at any point on the shell.

(c) Tanks may be located in hold spaces or in other cargo tanks meeting the requirements for cofferdams as prescribed in Section 32.60–10 or 32.65–15, and may be installed "on deck" or "under deck" with the tank protruding above deck. On installations where a portion of the tank extends through the weather deck, provision shall be made to maintain the watertightness of the deck. Where such tanks are installed in bulk liquid cargo tanks, the liquids in the surrounding tanks shall be inert to the toxic or poisonous liquids at temperatures of 100° F. and under, at atmospheric pressure.

(d) All tanks shall be installed with manhole openings and fittings located above the weather deck.

(e) No strength welding employed in the attachment of supports, lugs, fittings, etc., shall be done on tanks that require and have been stress-relieved, unless authorized by the Commandant.

SUBPART 39.10—PIPING, VALVES, FITTINGS, AND ACCESSORY EQUIPMENT

39.10–1 Valves and accessories—TB/ALL. (a) All shutoff valves and accessory equipment shall be of types suitable for use with the cargo to be carried. Gray iron castings shall not be employed in the construction of valves, fittings or flanges located outside the cargo tanks.

(b) All connections to tanks, except safety relief valves, pressure-vacuum relief valves, or gaging connections, shall have shutoff valves located as close to the tank as practicable.

39.10–5 Piping and fittings—TB/ALL. (a) Piping shall be suitable for use with the liquid cargo to be carried and shall conform to the requirements of Part 56 of Subchapter F (Marine Engineering) of this chapter. Piping shall be of seamless drawn material, except that electric resistance-welded steel piping will be acceptable.

(b) All pipe connections on pressure vessel tanks shall be grouped in the smallest practicable space and shall be located near the highest point on the tank. Alternate piping arrangements may be considered for approval by the Commandant.

(c) The pumps and cargo piping used for loading and discharging Class "B" or "C" poisons shall be independent of all other piping.

(d) Where multiple cargoes are carried, and the cargo piping conveying Class "B" or "C" poisons are led through cargo tanks containing other products the piping shall be encased in a tunnel.

(e) Where cargo lines for handling other products, or bilge and ballast piping are led through cargo tanks containing Class "B" or "C" poisons, the piping shall be encased in a tunnel.

(f) Where possible provision shall be made for expansion and contraction of piping by means of seamless steel pipe expansion bends. Corrugated expansion joints may be used, provided satisfactory evidence is shown that space limitations do not permit the use of expansion bends. Slip type expansion joints are prohibited.

39.10–10 Safety relief and pressure-vacuum relief valves—TB/ALL. (a) Each pressure vessel type cargo tank shall be fitted with one or more approved safety relief valves, set to start to discharge at a pressure of not less than 90 percent of the design pressure of the tank, but not in excess of the design pressure. Safety relief valves shall have sufficient relieving capacity to prevent a pressure rise exceeding 20 percent above the design pressure of the tank.

(b) Safety relief valves for pressure type cargo tanks shall be attached to the tank near the highest point of the vapor space.

(c) Gravity type cargo tanks shall be fitted with an approved pressure-vacuum relief valve of not less than 2½-inch size, which shall be set at a pressure of not less than 3 pounds per square inch, but not in excess of the design pressure of the tank.

(d) Pressure-vacuum relief valves for gravity type cargo tanks may be installed on the expansion

trunk or in the branch vent line between the expansion trunk and the vent header.

39.10–15 Gaging devices—TB/ALL. A closed gaging system shall be provided for determining the liquid level within the tanks.

SUBPART 39.15—SPECIAL CARGO HANDLING REQUIREMENTS

39.15–1 Warning sign at gangway—TB/ALL. When transferring bulk cargo a warning sign as provided in Paragraph 35.30–1 (b) of this subchapter shall be displayed to warn persons on board or in the vicinity of the tanks.

39.15–5 Cargo discharge—TB/ALL. The use of gas or liquid pressure to discharge the cargo from gravity type cargo tanks is prohibited. Gas or liquid pressure may be used to discharge the cargo from pressure vessel type cargo tanks, provided authorization is granted by the Commandant.

39.15–10 Pumproom controls—TB/ALL. Cargo pumps, valves and fittings used for the transfer of Class "B" or "C" poisons and installed in pumprooms located below the weather deck shall be provided with means of operation from a position above the freeboard deck.

SUBPART 39.20—VENTING AND VENTILATION

39.20–1 Venting—T/ALL. (a) Vent pipes shall be connected to each safety relief or pressure vacuum-relief valve. Tanks carrying Class "B" or "C" poisons shall be vented independent of tanks carrying other products. Tanks carrying the same Class products may be connected to a vent header system or each tank may be vented independently.

(b) The vent riser shall extend to a height above the weather deck equal to at least one-third the beam of the vessel and shall terminate at a comparable distance from any other living or working space, ventilator inlet, or source of vapor ignition. When special conditions prevent the vent outlets from being permanently installed at a height above the deck of one-third the beam of the vessel, an adjustable system shall be provided which, when extended vertically, shall reach a height of one-third the beam of the vessel.

(c) The safety relief valve may be fitted with a bypass having the full capacity of the relief valve and equipped with a manually operated stop valve to permit equalizing pressures during filling and discharging operations.

39.20–2 Venting—B/ALL. (a) Manned barges shall meet the requirements of Section 39.20–1.

(b) For unmanned barges, the following requirements shall apply:

(1) The discharge fittings from each safety relief or pressure vacuum relief valve shall be directed in such a manner as to not impinge on another tank, piping or any other equipment which would increase the fire hazard should burning products be discharged from the safety or pressure vacuum relief valve as a result of a fire or other casualty. In addition, the discharges shall be directed away from areas where it is likely that persons might be working and as remote as practicable from ventilation inlets and ignition sources. A common discharge header may be employed if desired. The area near the discharge fittings shall be clearly marked as a hazardous area.

(2) A means shall be provided for either the reclamation or safe venting of vapors during the loading and unloading operations. For this purpose the safety relief or pressure vacuum relief valve shall be provided with a valved bypass to a vapor return line shore connection which shall be used whenever vapor return shore facilities are available. In the event vapors must be vented to the atmosphere, a vent riser shall be connected to the vapor return line and extend at least 12 feet above the highest level accessible to personnel. The vent riser may be collapsible for ease of stowage when not in use. The vent riser shall not be connected to a safety relief or pressure vacuum valve. Vapor return lines or vent risers for tanks carrying the same class product may be connected to a common header system if desired.

(3) Tanks carrying Class "B" or "C" poisons shall be vented independent of tanks carrying other products.

39.20–5 Ventilation—TB/ALL. (a) Pumprooms located below the weather deck shall be fitted with power ventilation designed to assure sufficient air movement through the pumproom to avoid accumulation of toxic vapors. The ventilation system shall be of the exhaust type having blower capacity sufficient to permit a change of air of at least 20 times per hour. At least two exhaust inlet ducts shall be provided and located near the floor level and at points where a concentration of toxic vapors may be expected. At least two fresh air inlet ducts shall be provided.

(b) Enclosed pumprooms located above the weather deck shall be fitted with power ventilation having an exhaust type blower of sufficient capacity to permit a change of air of at least 10 times per hour. The exhaust inlet ducts shall be located at points where a concentration of toxic vapors may be expected. At least one fresh air inlet duct shall be provided.

(c) The outlet duct exhausts shall terminate at a distance of at least six feet above the enclosed space or pumproom and at least six feet from any entrance to the interior part of the vessel. The discharge end of the exhaust ducts shall be so located as to preclude the possibility of recirculating contaminated air through the pumproom, or other spaces where personnel may be present.

SUBPART 39.25—PERIODIC INSPECTIONS AND TESTS

39.25-1 Hydrostatic tests and inspection—TB/ALL. (a) Each pressure vessel tank shall be subjected to an internal examination biennially and to a hydrostatic test at the time of the periodic inspection on the fourth year after installation, and a like test shall be applied every fourth year thereafter.

(1) If there is evidence of corrosion or deterioration, the marine inspector may require additional internal examinations or hydrostatic tests at intermediate inspection periods.

(2) The hydrostatic test shall be equal to one and one-half times the design pressure. For lagged tanks the hydrostatic test shall be applied for a period of at least 20 minutes without pressure drop when portions of the jacket and lagging are not removed at intermediate inspection period.

(3) Lagged tanks shall have a portion of the jacket and lagging removed on the lower portion of the shell as directed by the marine inspector at least once every eight years for external examination.

(b) Gravity tanks and cargo tanks constructed integral with the vessel's hull shall be inspected as prescribed in Subpart 31.10 of Part 31 of this subchapter. Lagged gravity type tanks shall be examined as required by paragraph (a) of this section.

39.25-5 Removal of defective tanks—TB/ALL. If a pressure vessel fails to pass the tests prescribed in this subpart, or is deemed by the marine inspector to be unsuitable for continued use, it shall be removed from service unless otherwise authorized by the Commandant.

39.25-10 Safety valves—TB/ALL. (a) The safety relief valve discs shall be lifted from their seats in the presence of a marine inspector by either liquid, gas or vapor pressure at least once every four years to determine accuracy of adjustment and, if necessary, shall be reset.

(b) The setting and operation of the pressure-vacuum relief valves shall be checked in the presence of a marine inspector at the inspection for certification and at such other times as considered necessary.

PART 40—SPECIAL CONSTRUCTION, ARRANGEMENT, AND OTHER PROVISIONS FOR CARRYING CERTAIN FLAMMABLE OR COMBUSTIBLE DANGEROUS CARGOES IN BULK

SUBPART 40.01—APPLICATION

Sec.

40.01–1 General—TB/ALL.
40.01–5 Effective dates—TB/ALL.

SUBPART 40.05—ETHYLENE OXIDE

40.05–1 General—TB/ALL.
40.05–2 Tank vessel certification and other cargoes—TB/ALL.
40.05–5 How ethylene oxide may be carried—TB/ALL.
40.05–10 Design, construction and arrangement of cargo tanks—TB/ALL.
40.05–20 Installation of cargo tanks—TB/ALL.
40.05–30 Insulation—TB/ALL.
40.05–35 Cooling systems—TB/ALL.
40.05–40 Valves, fittings, and accessories—TB/ALL.
40.05–45 Liquid level gaging devices—TB/ALL.
40.05–50 Filling and discharge pipes—TB/ALL.
40.05–55 Cargo piping—TB/ALL.
40.05–60 Safety relief valves—TB/ALL.
40.05–65 Filling density—TB/ALL.
40.05–69 Venting—TB/ALL.
40.05–73 Ventilation—TB/ALL.
40.05–75 Cargo hose—TB/ALL.
40.05–80 Electrical bonding—TB/ALL.
40.05–83 Special cargo handling requirements—TB/ALL.
40.05–85 Information board—TB/ALL.
40.05–87 Tests and inspections—TB/ALL.

SUBPART 40.10—PROPYLENE OXIDE

40.10–1 General—TB/ALL.
40.10–2 Tank vessel certification and other cargoes—TB/ALL.
40.10–5 How propylene oxide may be carried—TB/ALL.
40.10–10 Design, construction, and arrangement of pressure-vessel type cargo tanks—TB/ALL.
40.10–20 Installation of cargo tanks—TB/ALL.
40.10–40 Valves, fittings, and accessories—TB/ALL.
40.10–45 Liquid level gaging device—TB/ALL.
40.10–50 Filling and discharge pipes—TB/ALL.
40.10–55 Cargo piping—TB/ALL.
40.10–60 Safety relief valves—TB/ALL.
40.10–65 Filling density—TB/ALL.
40.10–69 Venting—TB/ALL.
40.10–73 Ventilation—TB/ALL.
40.10–75 Cargo hose—TB/ALL.
40.10–80 Electrical bonding—TB/ALL.
40.10–83 Special cargo handling requirements—TB/ALL.
40.10–85 Warning signs and information cards—TB/ALL.
40.10–87 Tests and inspection—TB/ALL.

AUTHORITY: The provisions of this Part 40 issued under R.S. 4405, as amended, 4417a, as amended, 4462, as amended, sec. 6(b)(1), 80 Stat. 938; 46 U.S.C. 375, 391a, 416, 49 U.S.C. 1655(b); 49 CFR 1.4(a)(2). Sec. 3, 68 Stat. 675; 50 U.S.C. 198; E.O. 11239, July 31, 1965, 30 F.R. 9671, 3 CFR, 1965 Supp., unless otherwise noted.

SUBPART 40.01—APPLICATION

40.01–1 General—TB/ALL. (a) The provisions of this part shall apply to all vessels which carry in bulk any of the dangerous cargoes specifically noted in this part.

40.01–5 Effective dates—TB/ALL. (a) The provisions in Subpart 40.05 of this part shall be in effect on and after January 1, 1964.

(b) The provisions in Subpart 40.10 of this part shall be in effect on and after January 1, 1967.

SUBPART 40.05—ETHYLENE OXIDE

40.05–1 General — TB/ALL. (a) Ethylene oxide transported under the provisions of this subpart shall be acetylene free.

(b) Ethylene oxide may be carried in tank barges or tankships in accordance with the provisions of this subpart.

(c) No other product may be transported in tanks certified for ethylene oxide except that the Commandant may approve subsequent transportation of other products and return to ethylene oxide service if tanks, piping and auxiliary equipment are adequately cleaned to the satisfaction of the marine inspector.

40.05–2 Tank vessel certification and other cargoes—TB/ALL. (a) The certificate of inspection shall be endorsed as follows:

"Inspected and approved for the carriage of ethylene oxide in tank number(s)_____."

(b) Unless authorized by the Commandant, no other kind of cargo except methane, ethane, propane, butane and pentane shall be on board a tank vessel certificated for the carriage of ethylene oxide at the same time ethylene oxide in either the liquid or vapor state is present in any cargo tank. Ethylene oxide tanks shall not be installed in tanks intended for any other cargo.[1]

(R.S. 4421, as amended, 4472, as amended, 46 U.S.C. 399, 170)

40.05–5 How ethylene oxide may be carried—TB/ALL. (a) Ethylene oxide shall be carried in fixed, independent, pressure vessel type cargo tanks, designed, constructed, arranged and if necessary equipped with machinery to maintain the cargo temperature below 90° F. except as otherwise provided for in paragraph (c) of this section.

(b) Ethylene oxide shall be loaded at a temperature below 70° F.

[1] Ethylene oxide may rearrange and/or polymerize violently, liberating large quantities of heat. A few of the most notable catalysts for this type of reaction are: anhydrous iron, tin and aluminum chlorides; pure iron and aluminum oxides; metallic potassium; alkali metal hydroxides; acids and organic bases. The speed of the reaction varies with the purity of the reactants, the temperature, the relative amount of each reactant, and the method of application.

(c) When ethylene oxide is to be transported at or near atmospheric pressure, the Commandant may permit the use of alternate methods of storage if it is shown to his satisfaction that a degree of safety is obtained consistent with the minimum requirements of this subpart.

(R.S. 4488, as amended; 46 U.S.C. 481.)

40.05–10 Design, construction and arrangement of cargo tanks—TB/ALL. (a) All cargo tanks shall be constructed of a carbon steel or stainless steel acceptable to the Commandant. Impurities of copper, magnesium and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all steel used shall be submitted to the Commandant for approval prior to fabrication. Neither aluminum nor copper and other acetylide-forming metals, such as silver, mercury, magnesium, and their alloys shall be used as materials of construction for tanks or equipment used in handling ethylene oxide.

(b) Cargo shall be transported in cylindrical pressure vessel tanks, independent of the vessel's hull structure and so arranged as to provide a minimum clearance of not less than 24 inches from the vessel's side and not less than 15 inches from the vessel's bottom to provide access for inspection. When more than one tank is installed in a vessel, the distance between such tanks shall be not less than 15 inches unless otherwise approved by the Commandant.

(c) Cargo tanks shall meet the requirements of Class I arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(d) Cargo tanks shall be designed for the maximum pressure of vapor or gas used in discharging the cargo but in no case shall the design pressure of such tanks be less than the seventy-five (75) pounds per square inch gage. The tank shell and heads shall not be less than $\frac{5}{16}$ inch thick. The design of tanks shall take into account the expected stresses due to internal pressure, static head and localized stress concentrations.

(e) Each tank shall be provided with not less than one 15- x 23-inch eliptical or 18-inch diameter manhole located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to the tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4433, as amended; 46 U.S.C. 411)

40.05–20 Installation of cargo tanks—TB/ALL. (a) Cargo tanks shall be located below deck in holds or enclosed spaces with the domes or trunks extended above the weather deck and terminating in the open. Provisions shall be made to maintain the watertightness of the deck by means of watertight seals around such domes or trunks. The holds or enclosed spaces, in which the ethylene oxide tanks are located, shall not be used for any other purpose. The weathertightness of the weatherdeck may not be required to be fully maintained on: (1) Tankships operating on restricted routes which are sufficiently protected; or, (2) Open hopper type barges of a suitable design approved for such service.

(b) All cargo tanks shall be installed with the manhole openings and all tank connections located above the weather deck in the open.

(c) Tanks shall be suitably mounted on steel supports and anchored in place and suitably electrically bonded to the hull. Each tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the tank shell. Collision chocks shall be installed to prevent any longitudinal shifting of and damage to the cargo tanks in the event of collision. The design shall show the manner in which the tanks are to be installed, supported and secured in the barge or vessel and shall be approved prior to the installation of the tanks.

(d) No welding of any kind shall be done on cargo tanks or supporting structure unless authorized by the Commandant.

40.05–30 Insulation—TB/ALL. (a) All cargo tanks, piping, valves, fittings, etc., which may contain ethylene oxide in either the liquid or vapor phase, including the vent risers, shall be insulated. Flanges need not be covered, but if covered a small opening shall be left at the bottom of the flange cover to detect leaks. Insulation shall be of an approved incombustible material suitable for use with ethylene oxide, which does not significantly lower the autoignition temperature and which does not react spontaneously with ethylene oxide. The insulation shall be of such thickness as to provide a thermal conductance of not more than 0.075 B.t.u. per square foot per degree fahrenheit differential in temperature per hour.

(b) Insulation shall be of an approved type complying with the requirements of Subpart 164.009 of Subchapter Q (Specifications) of this chapter. However, the Commandant may consider alternate proposals where it is demonstrated to his satisfaction that adequate protection against fire exposure will be provided. Insulation shall be of a vapor-proof construction, or shall have a vapor-proof coating of a fire-retardant material acceptable to the Commandant. All insulation, vapor barrier and adhesive material shall be of a type which does not lower the autoignition temperature of or react spontaneously with ethylene oxide. Insulation exposed to the weather shall have the vapor-proof coating covered with a removable sheet metal jacket, not less than 0.083-inch thickness, flashed around all openings so as to be weathertight. The sheet metal jacket may be omitted when the vapor barrier is inherently

weather resistant. When a weather resistant vapor barrier is used, the insulation shall be protected by sheet metal in those areas subject to mechanical damage.

40.05–35 Cooling systems — TB/ALL. (a) When cooling systems are installed to maintain the temperature of the liquid below 90° F., at least two complete cooling plants, automatically regulated by temperature variations within the tanks shall be provided; each to be complete with the necessary auxiliaries for proper operation. The control system shall also be capable of being manually operated. An alarm shall be provided to indicate malfunctioning of the temperature controls. The capacity of each cooling system shall be sufficient to maintain the temperature of the liquid cargo at or below the design temperature of the system.

(b) An alternate arrangement may consist of three cooling plants, any two of which shall be sufficient to maintain the temperature of the liquid cargo at or below the design temperature of the system.

(c) Cooling systems requiring compression of ethylene oxide are prohibited.

40.05–40 Valves, fittings, and accessories—TB/ALL. (a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with ethylene oxide and shall be made of steel or stainless steel, or other materials acceptable to the Commandant. Impurities of copper, magnesium and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all material used shall be submitted to the Commandant for approval prior to fabrication. Disks or disk faces, seats and other wearing parts of valves shall be made of stainless steel containing not less than 11 percent chromium. Mercury, silver, aluminum, magnesium, copper and their alloys shall not be used for any valves, gages, thermometers, etc. Gaskets shall be constructed of spirally wound stainless steel with "Teflon" or other suitable material. All packing and gaskets shall be constructed of materials which do not react spontaneously with or lower the autoignition temperature of ethylene oxide.

(b) The pressure rating of valves, fittings, and accessories shall be not less than the maximum pressure for which the cargo tank is designed or the shutoff head of the cargo pump, whichever is greater, but in no case less than 150 pounds per square inch, American Standards Association's standards. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Threaded joints in the cargo liquid and vapor lines are prohibited.

(c) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, which shall be accessible for convenient operation. All connections to tanks shall be made above the weather deck in the open to a trunk or dome and shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited.

(d) All connections to the tanks, except safety relief valves, shall have manually operated shutoff valves located as close to the tank as possible. These valves are in addition to those required by Section 40.05–50.

(e) Excess flow valves, where installed, shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, valves, fittings and appurtenances protected by the excess flow valves, shall have a greater flow capacity than the rated flow of the excess flow valve.

(f) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size.

(g) Excess flow valves may be designed with a bypass, not to exceed a No. 60 drill size opening, to allow equalization of pressure.

(h) Relief valves shall be fitted in liquid and vapor lines which may be subject to excessive pressure due to thermal expansion when the lines are liquid full. The escape from these relief valves shall be piped to the venting system.

(i) The pressure gage connection shall be located at the highest practical point in the vapor space of the tank.

(j) The thermometer well shall terminate in the liquid space and shall be attached to the shell by welding with the end of the fitting being provided with a gastight screwed plug or bolted cover.

40.05–45 Liquid level gaging devices—TB/ALL. (a) Each tank shall be fitted with a liquid level gaging device of approved design to indicate the level to which the tank may be filled.

(b) Liquid level gaging devices may be the: Slip tube, magnetic, automatic float, or other types approved by the Commandant.

(c) Any gaging device that requires bleeding of the product to the atmosphere, snch as the slip tube, shall be so designed that the bleed valve maximum opening is not larger than a No. 54 drill size, unless provided with an excess flow valve.

(d) The automatic float continuous reading tape gage, and similar types, shall be fitted with a shutoff valve located as close to the tank as practicable, which shall be designed to close automatically in the event of fracture of the external gage piping. An auxiliary gaging device shall always be used in conjunction with an automatic gaging device. This auxiliary device may be a duplication of the automatic device.

40.05–50 Filling and discharge pipes—TB/ALL. (a) Filling and discharge piping shall extend to within four inches of the bottom of the tank or sump pit if one is provided.

(b) In addition to the shutoff valve required by Paragraph 40.05-40(d), all tank connections larger than ½ inch inside pipe size, except safety relief valves and liquid level gaging devices, shall be fitted with either internal back pressure check valves or internal excess flow valves in conjunction with a quick closing stop valve operable from at least two remote locations. The quick closing stop valve shall be of the "fail safe" type acceptable to the Commandant and shall be equipped with a fusible plug designed to melt between 208° F. and 220° F., which will cause the quick closing valve to close automatically in case of fire. The quick closing valve shall be located as close to the tank as possible.

40.05-55 Cargo piping—TB/ALL. (a) Piping systems intended for ethylene oxide service shall not be used for any other product and shall be completely separate from all other systems. The piping system shall be designed so that no cross connections may be made either through accident or design.

(b) The piping system shall be designed for a working pressure of not less than the maximum pressure to which the system may be subjected, however, in no case shall the design pressure be less than 150 pounds per square inch. In the case of piping on the discharge side of the liquid pumps or vapor compressors, the design pressure shall be not less than the pump or compressor discharge relief valve setting; or, provided the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(c) Piping shall be seamless drawn or electric resistance welded steel or stainless steel.

(d) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless pipe expansion bends or offsets. Suitable means shall be provided for maintaining the piping in a fixed position.

(e) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings and to prevent excessive vibration.

40.05-60 Safety relief valves—TB/ALL. (a) Each tank shall be fitted with one or more approved safety relief valves designed, constructed and flow-tested for capacity in conformance with Subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489.)

(b) Each safety relief valve shall be set to start to discharge at not less than 75 pounds per square inch gage, nor more than the designed pressure of the tank.

(c) The safety relief valves shall meet the relief capacity, arrangement and inspection requirements of Section 54.15-25 of Subchapter F (Marine Engineering) of this chapter, except that the inspection shall also indicate that the safety relief valves will start to discharge at a pressure of not less than 75 pounds per square inch gage.

40.05-65 Filling density—TB/ALL. (a) The filling density shall not exceed 83 percent. Filling density is defined as the ratio of the weight of material which may be loaded into the tank to the weight of water the tank will hold at 60° F. expressed as a percentage.

40.05-69 Venting — TB/ALL. (a) Tanks carrying ethylene oxide shall be vented through the safety relief valves independent of tanks carrying other products. Each safety relief valve installed on a cargo tank shall be connected to a venting system consisting of a branch vent from each cargo tank connected to a vent header which shall extend to a height above the weather deck to at least one-third the beam of the vessel and shall terminate at a comparable distance from any working or living space, ventilator inlet, or source of vapor ignition. When special conditions would prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height one-third of the beam of the vessel. During loading and unloading operations the displaced ethylene oxide vapor shall be returned to the loading facility.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header vents as provided for in Table 40.05-69(b), and upon the total safety relief valve discharge.

Table 40.05-69(b)—Capacity of Branch Vents or Vent Headers

Number of cargo tanks	Percent of total valve discharge
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical damage and such discharge pipes shall be fitted with

loose raincaps or other suitable means to prevent entrance of rain or snow. A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(g) No shutoff valve of any type shall be fitted in the vent piping between the safety relief valve and the vent outlets.

(h) Suitable provision shall be made for draining condensate which may accumulate in the vent piping.

(i) The outlet of each vent riser will be fitted with acceptable corrosion-resistant flame screen of suitable material or a flame arrester suitable for use with ethylene oxide.

(j) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a height of not less than one-third the beam of the vessel but in no case less than seven feet above the deck. Alternate arrangements consisting of a branch vent header system may be installed. In any case, all other provisions of paragraphs (a) through (i) of this section apply.

40.05–73 Ventilation—TB/ALL. (a) All enclosed spaces within the hull shall be vented or ventilated in accordance with the provisions of this subchapter except as otherwise provided for in this subpart.

(b) The enclosed spaces on tankships and manned barges in which the cargo tanks are located shall be rendered inaccessible to personnel while the vessel is underway and shall be inerted by injection of a suitable inert gas or shall be well ventilated.

(c) The enclosed spaces on tankships and manned barges in which the cargo tanks are located, if an inerting system is not installed, shall be fitted with forced ventilation of such capacity to provide a complete change of air every three minutes and arranged in such a manner that any vapors lost into the space will be removed. The ventilation system shall be in operation at all times cargo is being loaded or discharged. No electrical equipment shall be fitted within the spaces or within 10 feet of the ventilation exhaust from these spaces.

(d) All ventilation machinery shall be of nonsparking construction and shall not provide a source of vapor ignition.

(e) Each vent shall be fitted with a flame screen of corrosion resistant wire which is suitable for use with ethylene oxide.

40.05–75 Cargo hose—TB/ALL. (a) Flexible metal hose fabricated of stainless steel or other acceptable material, resistant to the action of ethylene oxide, shall be fitted to the liquid and vapor lines during filling and discharging of the tanks.

(b) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(c) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor safety relief valve.

(d) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be tested hydrostatically by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked with the maximum pressure guaranteed by the manufacturer, and with the words "Certified For Ethylene Oxide".

(e) Cargo hose intended for ethylene oxide service shall not be used for any other products except those which are compatible with ethylene oxide.

(R.S. 4488, as amended ; 46 U.S.C. 481.)

40.05–80 Electrical bonding—TB/ALL. (a) Each cargo tank shall be electrically bonded to the hull. The vessel shall be electrically bonded to the shore piping prior to connecting the cargo hose. This electrical bonding shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

40.05–83 Special cargo handling requirements—TB/ALL. (a) Cargo shall be discharged by pumping or by displacement with nitrogen or other acceptable inert gas. In no case shall air be allowed to enter the system. During loading and unloading operations the vapor shall not be discharged to the atmosphere. Provisions shall be made to return all displaced vapor to the loading facility. The loading rate and the pressure applied to the tank to discharge the cargo shall be so limited that the safety relief valves will not be caused to open.

(b) The cargo shall be shipped under a suitable protective padding, such as nitrogen gas. When nitrogen gas is used, the gas padding system shall be so designed that the vapor space above the liquid cargo will be filled and maintained with a gas mixture of not less than 45 percent nitrogen. Other gases proposed for use as padding may be given consideration by the Commandant. Original charging only of protective gas padding at the loading facility is not considered adequate. A sufficient amount of spare inerting gas as approved by the Commandant shall be provided on the vessel in order to maintain the proper concentration of the gas in the event of normal leakage or other losses.

(c) Any padding gas selected should be at least 98.0 percent pure and free of reactive materials, such as ammonia, hydrogen sulfide, sulfur compounds, and acetylene.

(d) A water spray extinguishing system shall be provided in the area where loading and unload-

ing operations are conducted. The system shall be designed to operate automatically in case of fire. The capacity and arrangement shall be of such as to effectively blanket the area in way of the loading manifold and exposed deck piping for ethylene oxide. The rate of discharge and the arrangement of piping and nozzles shall be such as to give a uniform distribution over the entire area protected. Additionally, means shall be provided for local and remote manual operation. The arrangement shall be such that any spilled cargo will be washed away. A water hose with pressure to the nozzle, when atmospheric temperatures permit, shall be connected ready for immediate use during filling and discharge operations and any spillage of ethylene oxide shall be immediately washed away.

(e) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header. The liquid and vapor discharged from these lines shall not be discharged to atmosphere.

(f) Prior to loading, a sample from the cargo tank will be taken to insure that the pad gas will meet the requirements of paragraph (b) of this section and that the oxygen content of the vapor space will be not more than 2.0 percent maximum. If necessary, a sample will be taken after loading to insure the vapor space meets this requirement.

(g) The owner, master or person in charge of any vessel subject to the provisions of this part shall insure that during cargo transfer operations the persons required by Subpart 35.35 of this subchapter shall be especially qualified in the handling of ethylene oxide.

(R.S. 4488, as amended; 46 U.S.C. 481.)

40.05-85 Information board—TB/ALL. (a) A suitable information board shall be installed upon which shall be posted the information described in this section.

(b) The following information shall remain posted on board from time cargo transfer operations begin until the vessel is gas-free or changes cargo:

(1) Identification of the cargo.

(2) A description of the principal characteristics of the cargo.

(3) Instructions for the safe handling of the cargo, including operating procedures for maintaining the required cargo temperature.

(4) List and locations of all safety equipment.

(5) Emergency procedures.

(R.S. 4488, as amended; 46 U.S.C. 481.)

40.05-87 Tests and inspections—TB/ALL. (a) Each tank shall be subjected to the tests and inspections described in this paragraph in the presence of a marine inspector, except as otherwise provided in this section.

(1) An internal examination shall be made at least once in each four calendar years.

(2) Sufficient insulation shall be removed from the tank at least once in each four calendar years for spot external examination of the tank.

(3) A hydrostatic test of 1½ times the design pressure shall be made at least once in each four years at the time the internal examination is made and at such other times as considered necessary by the marine inspector.

(4) The safety relief valves shall be tested by liquid, gas, or vapor pressure at least once every two years to determine the accuracy of adjustment and, if necessary, shall be reset. Ethylene oxide shall not be used as the testing medium.

(b) The cargo hose and piping shall be inspected and tested at least once in each two calendar years.

(1) The cargo hose and piping shall be subjected to a hydrostatic test of 1½ times the maximum pressure to which they may be subjected in service.

(2) If any leakage, seepage or distortion is noted at any time, the hose shall be removed from service and replaced and/or the piping shall be repaired.

(3) In those cases where the cargo hose used is not part of the vessel's equipment, the senior deck officer shall determine that the provisions of this paragraph have been met before using such hose. A certificate of test, supplied by the loading facility, will be considered as adequate for this determination.

(R.S. 4453, as amended, 4488, as amended; 46 U.S.C. 435, 481)

SUBART 40.10—PROPYLENE OXIDE

40.10-1 General—TB/ALL. (a) Propylene oxide transported under the provisions of this subpart shall be acetylene free.

(b) Propylene oxide may be carried in tank barges or tankships in accordance with the provisions of this subpart.

(c) No other product may be transported in tanks certified for propylene oxide except that the Commandant may approve subsequent transportation of other products and return to propylene oxide service if tanks, piping and auxiliary equipment are adequately cleaned to the satisfaction of the marine inspector.

40.10-2 Tank vessel certification and other cargoes—TB/ALL. (a) The certificate of inspection shall be endorsed as follows:

Inspected and approved for the carriage of propylene oxide in tank number(s)_____.

(b) Unless authorized by the Commandant, no other kind of cargo except methane, ethane, propane, butane and pentane shall be on board a tank vessel certificated for the carriage of pro-

pylene oxide at the same time propylene oxide in either the liquid or vapor state is present in any cargo tank. Propylene oxide tanks shall not be installed in tanks intended for any other cargo.

(R.S. 4421, as amended, 4472, as amended; 46 U.S.C. 399, 170)

40.10–5 How propylene oxide may be carried—TB/ALL. (a) Propylene oxide shall be carried in fixed, independent pressure-vessel type cargo tanks except as otherwise provided in paragraph (b) of this section.

(b) The Commandant may permit the transportation of propylene oxide in other than pressure-vessel type cargo tanks if it is shown to his satisfaction that the proposed method of transportation affords a degree of safety consistent with the minimum requirements of this subpart.

(R.S. 4488, as amended; 46 U.S.C. 481)

40.10–10 Design, construction, and arrangement of pressure-vessel type cargo tanks—TB/ALL. (a) All cargo tanks shall be constructed of a carbon steel or stainless steel acceptable to the Commandant. Impurities of copper and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all steel used shall be submitted to the Commandant for approval prior to fabrication. Copper and other acetylide forming metals, such as silver, mercury, and their alloys, shall not be used as materials of construction for tanks or equipment used in handling propylene oxide.

(b) Cargo shall be transported in cylindrical pressure-vessel tanks which are independent of the vessel's hull structure. Adequate clearance shall be provided for the inspection and maintenance of the tanks, or such tanks shall be made movable.

(c) Cargo tanks shall meet the requirements of Class II arc-welded unfired pressure vessels and shall be fabricated, inspected and tested in accordance with the applicable requirements of Subchapter F (Marine Engineering) of this chapter.

(d) Cargo tanks shall be designed for the maximum pressure expected to be encountered during loading, storing and discharging the cargo but in no case shall the design pressure of such tanks be less than thirty (30) pounds per square inch gage. The tank shell and heads shall not be less than 5/16 inch thick. The design of tanks shall take into account the expected stresses due to internal pressure, static head and localized stress concentration.

(e) Each tank shall be provided with not less than one 15 x 23-inch elliptical or 18-inch diameter manhole located above the maximum liquid level and as close as possible to the top of the tank. Where access trunks are fitted to the tanks, the diameter of the trunks shall be not less than 30 inches.

(R.S. 4433, as amended; 46 U.S.C. 411)

40.10–20 Installation of cargo tanks—TB/ALL. (a) Cargo tanks shall be located below deck in holds or enclosed spaces with the domes or trunks extended above the weather deck and terminating in the open. Provisions shall be made to maintain the watertightness of the deck by means of watertight seals around such domes or trucks. The holds or enclosed spaces, in which the propylene oxide tanks are located, shall not be used for any other purpose. The weathertightness of the weather deck may not be required to be fully maintained on:

(1) Tankships operating on restricted routes which are sufficiently protected; or

(2) Open hopper type barges designed in accordance with criteria set forth in Subpart 32.63 of this subchapter.

(b) All cargo tanks shall be installed with the manhole openings and all tank connections located above the weather deck in the open.

(c) Tanks shall be mounted on suitable supports, be anchored in place, and electrically bonded to the hull. Each tank shall be so supported as to prevent the excessive concentration of loads on the supporting portion of the tank shell. Collision chocks shall be installed to prevent any longitudinal shifting of and damage to the cargo tanks in the event of collision. The design shall show the manner in which the tanks are to be installed, supported, and secured in the barge or vessel and shall be approved prior to the installation of the tanks. Tanks on barges shall comply with the applicable sections of Subpart 32.63 of this subchapter.

(d) No welding of any kind shall be done on cargo tanks or supporting structure unless authorized by the Officer in Charge, Marine Inspection.

40.10–40 Valves, fittings, and accessories—TB/ALL. (a) All valves, flanges, fittings, and accessory equipment shall be of a type suitable for use with propylene oxide and shall be made of steel or stainless steel, or other materials acceptable to the Commandant. Impurities of copper and other acetylide-forming metals shall be kept to a minimum. The chemical composition of all material used shall be submitted to the Commandant for approval prior to fabrication. Disc or disc faces, seats, and other wearing parts of valves shall be made of stainless steel containing not less than 11 percent chromium. Mercury, silver, copper and their alloys shall not be used for any valves, gages, thermometers, etc. Gaskets shall be constructed of spirally wound stainless steel with "Teflon" or other suitable material. All packing and gaskets shall be constructed of materials which do not react spontaneously with or lower the autoignition temperature of propylene oxide.

(b) The pressure rating of valves, fittings, and accessories shall be not less than the maximum pressure for which the cargo tank is designed or

the shutoff head of the cargo pump, whichever is greater, but in no case less than 150 pounds per square inch, American Standards Association's standards. Welded fittings shall be used wherever possible and the number of pipe joints shall be held to a minimum. Threaded joints in the cargo liquid and vapor lines are prohibited.

(c) Each tank shall be provided with the necessary fill and discharge liquid and vapor shutoff valves, safety relief valves, liquid level gaging devices, thermometer well and pressure gage, which shall be accessible for convenient operation. All connections to tanks shall be made above the weather deck in the open to a trunk or dome and shall be protected against mechanical damage and tampering. Other openings in the tanks, except as specifically permitted by this part, are prohibited unless specifically authorized by the Commandant.

(d) All connections to tanks, except safety relief valves and liquid level gaging devices shall have manually operated shutoff valves located as close to the tank as possible. In addition, all liquid and vapor connections on pressure vessel type tanks except safety relief valves, liquid level gaging devices, and filling and discharge lines, shall be equipped with either an automatic excess flow valve or a remotely controlled quick-closing shutoff valve of the fail closed type. These valves, except when necessary for the operation of the system, shall remain closed.

(e) The control system for quick-closing shutoff valves shall be provided with a remote control in at least two locations and be of a type acceptable to the Comandant. The control system shall also be provided with a fusible element designed to melt between 208° F. and 220° F., which will cause the quick-closing shutoff valves to close in case of fire. The quick-closing shutoff valves shall be capable of local manual operation.

(f) Excess flow valves, where installed, shall close automatically at the rated flow of vapor or liquid as specified by the manufacturer. The piping, valves, fittings and appurtenances protected by the excess flow valves, shall have a greater flow capacity than the rated flow of the excess flow valve.

(g) Pressure gage connections need not be equipped with excess flow valves if the openings are not larger than No. 54 drill size (0.055 inch diameter).

(h) Excess flow valves may be designed with a bypass not to exceed a No. 60 drill size (0.040 inch diameter) opening, to allow equalization of pressure.

(i) Relief valves shall be fitted in liquid lines which may be subject to excessive pressure due to thermal expansion when the lines are liquid full. The escape from these relief valves shall be piped to the venting system.

(j) The pressure gage connection shall be located at the highest practical point in the vapor space of the tank.

(k) The thermometer well shall terminate in the liquid space and shall be attached to the shell by welding with the end of the fitting being provided with a gastight screwed plug or bolted cover.

(R.S. 4433, as amended, 4488, as amended; 46 U.S.C. 411, 481)

40.10–45 Liquid level gaging device—TB/ALL. (a) Each tank shall be fitted with a liquid level gaging device of approved design to indicate the level to which the tank may be filled.

(b) Liquid level gaging devices may be the slip tube, magnetic, automatic float, differential pressure, or other types approved by the Commandant.

(c) Any gaging device that requires bleeding of the product to the atmosphere, such as the slip tube, shall be so designed, that the bleed valve maximum opening is not larger than a No. 54 drill size (0.055 inch diameter), unless provided with an excess flow valve.

(d) The automatic float continuous reading tape gage, and similar types, shall be fitted with a shutoff valve located as close to the tank as practicable, which shall be designed to close from a remote position in the event of fracture of the external gage piping. An auxiliary gaging device shall always be used in conjunction with an automatic gaging device. This auxiliary device may be a duplication of the automatic device.

40.10–50 Filling and discharge pipes—TB/ALL. (a) Filling piping shall extend to within 4 inches of the bottom of the tank or sump pit if one is provided.

(b) Filling and discharge connections shall be provided with the manually operated valve required by Paragraph 40.10–40(d) and with a positive acting remote controlled quick-closing valve. The remote controlled quick-closing valve shall satisfy the requirements of Paragraph 40.10–40(e).

(c) For pressure vessel type tanks the remote controlled quick-closing valves shall be located on the inside of the tank or on the outside where the piping enters the tank.

(d) For nonpressure vessel type tanks the remote controlled quick-closing valves may be located at the loading and discharge headers.

40.10–55 Cargo piping—TB/ALL. (a) When propylene oxide is carried on board a vessel, piping systems in propylene oxide service shall not be used for any other product and shall be completely separate from all other systems. The piping system shall be designed so that no cross connection may be made through inadvertence.

(b) The piping system shall be designed for a working pressure of not less than the maximum pressure to which the system may be subjected, however, in no case shall the design pressure be less than 150 pounds per square inch. In the case of piping on the discharge side of the liquid pumps

or vapor compressors, the design pressure shall be not less than the pump or compressor discharge relief valve setting; or, provided the piping is not fitted with relief valves, the design pressure shall not be less than the total discharge head of the pump or compressor.

(c) Piping shall be seamless drawn or electric resistance welded steel or stainless steel.

(d) Where necessary, provision shall be made for expansion and contraction of piping by means of seamless pipe expansion bends or offsets. Suitable means shall be provided for maintaining the piping in a fixed position.

(e) Piping shall be provided with adequate support to take the weight of the piping off the valves and fittings and to prevent excessive vibration.

40.10–60 Safety relief valves—TB/ALL. (a) Each tank shall be fitted with one or more approved safety relief valves designed, constructed and flow-tested for capacity in conformance with subpart 162.018 of Subchapter Q (Specifications) of this chapter.

(R.S. 4491, as amended; 46 U.S.C. 489)

(b) Each safety relief valve shall be set to start to discharge at not less than 30 pounds per square inch gage, nor more than the design pressure of the tank.

(c) The safety relief valves shall meet the relief capacity, arrangement and inspection requirements of Section 54.15–25 of Subchapter F (Marine Engineering) of this chapter, except that the inspection shall also indicate that the safety relief valves will start to discharge at a pressure of not less than 30 pounds per square inch gage.

40.10–65 Filling density—TB/ALL. (a) Filling density shall not exceed 80 percent. Filling density is defined as the ratio of the weight of material which may be loaded into the tank to the weight of water the tank will hold at 60° F. expressed as a percentage.

40.10–69 Venting—TB/ALL. (a) Tanks carrying propylene oxide shall be vented through the safety relief valves independent of tanks carrying other products. Each safety relief valve installed on a cargo tank shall be connected to a venting system consisting of a branch vent from each cargo tank connected to a vent header which shall extend to a height above the weather deck to at least one-third the beam of the vessel and shall terminate at a comparable distance from any working or living space, ventilator inlet, or source of vapor ignition. When special conditions would prevent the vent line or header outlets being permanently installed at a height above the deck of one-third the beam of the vessel, then an adjustable system shall be provided which, when extended vertically, shall be capable of reaching a height one-third of the beam of the vessel. During loading and unloading operations the displaced propylene oxide vapor shall be returned to the loading facility.

(b) The capacity of branch vents or vent headers shall depend upon the number of cargo tanks connected to such branch or header vents as provided for in Table 40.10–69(b), and upon the total safety relief valve discharge.

TABLE 40.10–69(b)—CAPACITY OF BRANCH VENTS OR VENT HEADERS

Number of cargo tanks	Percent of total valve discharge
1 or 2	100
3	90
4	80
5	70
6 or more	60

(c) In addition to the requirements specified in paragraphs (a) and (b) of this section, the size of the branch vents or vent headers shall be such that the back pressure in the relief valve discharge lines shall not be more than 10 percent of the safety relief valve setting.

(d) Return bends and restrictive pipe fittings are not permitted.

(e) Vents and headers shall be so installed as to prevent excessive stresses on safety relief valve mountings.

(f) The vent discharge riser shall be so located as to provide protection against mechanical damage and such discharge pipes shall be fitted with loose raincaps or other suitable means to prevent entrance of rain or snow. A weather hood may be installed at the vent outlet providing it is of such design as not to direct the flow of vapor below the horizontal.

(g) No shutoff valve of any type shall be fitted in the vent piping between the safety relief valve and the vent outlets.

(h) Suitable provision shall be made for draining condensate which may accumulate in the vent piping.

(i) The outlet of each vent riser will be fitted with acceptable corrosion-resistant flame screen of suitable material or a flame arrestor suitable for use with propylene oxide.

(j) Safety relief valves on cargo tanks in barges may be connected to individual or common risers which shall extend to a height of not less than one-third the beam of the vessel but in no case less than 7 feet above the deck. Alternate arrangements consisting of a branch vent header system may be installed. In any case, all other provisions of paragraphs (a) through (i) of this section apply.

40.10–73 Ventilation—TB/ALL. (a) All enclosed spaces within the hull shall be vented or ventilated in accordance with the provisions of this

subchapter except as otherwise provided for in this subpart.

(b) The enclosed spaces on tankships and manned barges in which the cargo tanks are located shall be rendered inaccessible to personnel while the vessel is underway and shall be inerted by injection of a suitable inert gas or shall be well ventilated.

(c) The enclosed spaces on tankships and manned barges in which the cargo tanks are located, if an inerting system is not installed, shall be fitted with forced ventilation of such capacity to provide a complete change of air every 3 minutes and arranged in such a manner that any vapors lost into the space will be removed. The ventilation system shall be in operation at all times cargo is being loaded or discharged. No electrical equipment shall be fitted within the spaces or within 10 feet of the ventilation exhaust from these spaces.

(d) All ventilation machinery shall be of nonsparking construction and shall not provide a source of vapor ignition.

(e) Each vent shall be fitted with a flame screen of corrosion-resistant wire which is suitable for use with propylene oxide.

40.10-75 Cargo hose—TB/ALL. (a) When the cargo hose is carried on board the vessel as part of its normal equipment, it shall meet the following requirements:

(1) Only flexible metal hose, fabricated of stainless steel or other acceptable metal, resistant to the action of propylene oxide, shall be used during filling and discharging of the tanks.

(2) Hose subject to tank pressure shall be designed for a bursting pressure of not less than five times the maximum safety relief valve setting of the tank.

(3) Hose subject to discharge pressure of pumps or vapor compressors shall be designed for a bursting pressure of not less than five times the pressure setting of the pump or compressor safety relief valve.

(4) Before being placed in service, each new cargo hose, with all necessary fittings attached, shall be tested hydrostatically by the manufacturer to a pressure of not less than twice the maximum pressure to which it may be subjected in service. The hose shall be marked by the manufacturer, with the maximum guaranteed pressure and with the words "Certified For Propylene Oxide".

(5) Cargo hose intended for propylene oxide service shall not be used for any other products except those which are compatible with propylene oxide.

(R.S. 4488, as amended, 46 U.S.C. 481)

40.10-80 Electrical bonding—TB/ALL. (a) Each cargo tank shall be electrically bonded to the hull. The vessel shall be electrically bonded to the shore piping prior to connecting the cargo hose. This electrical bonding shall be maintained until after the cargo hose has been disconnected and any spillage has been removed.

40.10-83 Special cargo handling requirements—TB/ALL. (a) Cargo shall be discharged by pumping or by displacement with nitrogen or other acceptable inert gas. In no case shall air be allowed to enter the system. During loading and unloading operations the vapor shall not be discharged to the atmosphere. Provisions shall be made to return all displaced vapor to the loading facility. The loading rate and the pressure applied to the tank to discharge the cargo shall be so limited that the safety relief valves will not be caused to open.

(b) The cargo shall be shipped under a suitable protective padding, such as nitrogen gas. Other gases proposed for use as padding may be given consideration by the Commandant. Original charging only of protective gas padding at the loading facility is not considered adequate. A sufficient amount of spare inerting gas as approved by the Commandant shall be provided on the vessel in order to maintain the proper concentration of the gas in the event of normal leakage or other losses.

(c) Any padding gas selected should be at least 98.0 percent inert gases, and free of reactive materials.

(d) A water spray extinguishing system shall be provided in the area where loading and unloading operations are conducted. The system shall be designed to operate automatically in case of fire. The capacity and arrangement shall be such as to blanket effectively the area in way of the loading manifold and exposed deck piping for propylene oxide. The rate of discharge and the arrangement of piping and nozzles shall be such as to give a uniform distribution over the entire area protected. Additionally, means shall be provided for local and remote manual operation. The arrangement shall be such that any spilled cargo will be washed away. A water hose with pressure to the nozzle, when atmospheric temperatures permit, shall be connected ready for immediate use during filling and discharge operations and any spillage of propylene oxide shall immediately be washed away.

(e) Prior to disconnecting shore lines, the pressure in the liquid and vapor lines shall be relieved through suitable valves installed at the loading header. The liquid and vapor discharged from these lines shall not be discharged to the atmosphere.

(f) Prior to loading, a sample from the cargo tank will be taken to insure that the pad gas will meet the requirements of paragraph (b) of this section and that the oxygen content of the vapor space will be not more than 2.0 percent maximum. If necessary, a sample will be taken after loading to insure the vapor space meets this requirement.

(g) The owner, master or person in charge of any vessel subject to the provisions of this part shall insure that during cargo transfer operations the persons required by Subpart 35.35 of this subchapter shall be especially qualified in the handling of propylene oxide.

(R.S. 4488, as amended, 46 U.S.C. 481)

40.10–85 Warning signs and information cards—TB/ALL. Vessels carrying propylene oxide in bulk shall comply with the applicable provisions of Section 35.01–55 of this subchapter.

(R.S. 4488, as amended, 46 U.S.C. 481)

40.10–87 Tests and inspection—TB/ALL. (a) Each tank shall be subject to the tests and inspections described in this paragraph in the presence of a marine inspector, except as otherwise provided in this section.

(1) An internal examination shall be made at least once in each 4 calendar years.

(2) A hydrostatic test of 1½ times the design pressure shall be made at least once in each 4 years at the time the internal examination is made and at such times as considered necessary by the marine inspector.

(3) To the extent and if deemed necessary by the marine inspector sufficient insulation shall be removed from insulated tanks at least once in each 4 calendar years to permit spot external examination of the tanks and insulation. The marine inspector may require that the thickness of the tanks be gaged by an acceptable nondestructive means without removal of insulation.

(4) The safety relief valves shall be tested by liquid, gas, or vapor pressure at least once every 2 years to determine the accuracy of adjustment and, if necessary shall be reset. Propylene oxide shall not be used as the testing medium.

(b) The cargo hose shall be inspected and tested at least once in each 2 calendar years.

(1) The cargo hose and piping shall be subjected to a hydrostatic test of 1½ times the maximum pressure to which they may be subjected in service.

(2) If any leakage, seepage or distortion is noted at any time, the hose shall be removed from service and replaced and/or the piping shall be repaired.

(R.S. 4453, as amended, 4488, as amended; 46 U.S.C. 435, 481)

APPENDIX

ACCEPTANCE OF CERTIFICATES AND/OR REGISTERS ISSUED BY AMERICAN BUREAU OF SHIPPING

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Orders 120 dated July 31, 1950 (15 F.R. 6521), 167–14 dated November 26, 1954 (19 F.R. 8026), 167–20 dated June 18, 1956 (21 F.R. 4894), CGFR 56–28 dated July 24, 1956 (21 F.R. 5659), and 167–38 dated October 26, 1959 (24 F.R. 8857), and the applicable inspection laws administered in conjunction with R.S. 4405, as amended, 4462, as amended (46 U.S.C. 375, 416), and the regulations in 46 CFR 31.10–16, 71.25–25 and 91.25–25: *It is ordered*, That:

(a) The valid current certificates and/or registers issued by the American Bureau of Shipping with home office at 45 Broad Street, New York, New York, 10004, attesting to the tests and surveys of shipboard cargo gear on a passenger, cargo, or miscellaneous vessel conducted by or for such Bureau, may be accepted as prima facie evidence of the condition and suitability of such gear by the Coast Guard when performing an inspection of a vessel as further described in 46 CFR 31.10–16, 71.25–25 or 91.25–25: *Provided*, That:

(1) Such certificates and/or registers shall be maintained currently and shall indicate that the described shipboard cargo gear for the particular vessel described therein complies with the standards respecting shipboard cargo gear as set forth in the Convention Concerning the Protection Against Accidents of Workers Employed in Loading or Unloading Ships (Revised) (International Labor Organization Convention No. 32); and,

(2) The dates when such tests or surveys were conducted, together with the signature or initials of the competent persons performing them shall be recorded therein.

(b) This approval and permission to accept valid current certificates and/or registers of the American Bureau of Shipping shall become effective on the date of publication of this document in the Federal Register and shall be in effect until suspended, amended, or canceled by proper authority. (This approval continues in effect the approval previously published in the regulations of June 5, 1957, 22 F.R. 3921, as well as in the Federal Register of November 23, 1961; 26 F.R. 10996.

(CGFR 63-1 dated January 15, 1963, published January 23, 1963, 28 F.R. 598)

ACCEPTANCE OF CERTIFICATES AND/OR REGISTERS ISSUED BY INTERNATIONAL CARGO GEAR BUREAU, INC.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Orders 120, dated July 31, 1950 (15 F.R. 6521), 167–14, dated November 26, 1954 (19 F.R. 8026), 167–20, dated June 18, 1956 (21 F.R. 4894), and CGFR 56–28, dated July 24, 1956 (21 F.R. 5659), and the applicable inspection laws administered in conjunction with R.S. 4405, as amended, and 4462, as amended (46 U.S.C. 375, 416), and the regulations in 46 CFR 31.10–16, 71.25–25 and 91.25–25: *It is ordered*, That:

(1) The valid current certificates and/or registers issued by the International Cargo Gear Bureau, Inc., with home office at 52 Broadway, New York, New York, 10004, attesting to the tests and surveys of shipboard cargo gear on a passenger, cargo, or miscellaneous vessel conducted by or for such Bureau, may be accepted as prima facie evidence of the condition and suitability of such gear by the Coast Guard when performing an inspection of a vessel as further described in 46 CFR 31.10–16, 71.25–25 or 91.25–25: *Provided*, That:

(a) Such certificates and/or registers shall be maintained currently and shall indicate that the described shipboard cargo gear for the particular vessel described therein complies with the standards respecting shipboard cargo gear as set forth in the Convention Concerning the Protection Against Accidents of Workers Employed in Loading or Unloading Ships (Revised) (International Labor Organization Convention No. 32); aud,

(b) The dates when such tests or surveys were conducted, together with the signatures or initials of the competent persons performing them shall be recorded therein.

(2) This approval and permission to accept valid current certificates and/or registers of the International Cargo Gear Bureau, Inc., shall become effective on the date of publication of this document in the Federal Register and shall be in effect until suspended or canceled by proper authority.

(CGFR 56-47, dated November 19, 1957, published November 22, 1957, 22 F.R. 9368, as amended by CGFR 61-44, dated November 17, 1961, published November 23, 1961, 26 F.R. 10996)

ACCEPTANCE OF CERTIFICATES AND/OR REGISTERS ISSUED BY NATIONAL CARGO BUREAU, INC.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Orders 120, dated July 31, 1950 (15

F.R. 6521), 167–14, dated November 26, 1954 (19 F.R. 8026), 167–20, dated June 18, 1956 (21 F.R. 4894), CGFR 56–28, dated July 24, 1956 (21 F.R. 5659), and 167–38, dated October 26, 1959 (24 F.R. 8857), and the applicable inspection laws administered in conjunction with R.S. 4405, as amended, 4462, as amended (46 U.S.C. 375, 416), and the regulations in 46 CFR 31.10–16, 71.25–25 and 91.25–25: *It is ordered*, That:

(a) The valid current certificates and/or registers issued by the National Cargo Bureau, Inc., with home office at 99 John Street, New York, New York, 10038, attesting to the tests and surveys of shipboard cargo gear on a passenger, cargo, or miscellaneous vessel conducted by or for such Bureau, may be accepted as prima facie evidence of the condition and suitability of such gear by the Coast Guard when performing an inspection of a vessel as further described in 46 CFR 31.10–16, 71.25–25 or 91.25–25: *Provided*, That:

(1) Such certificates and/or registers shall be maintained currently and shall indicate that the described shipboard cargo gear for the particular vessel described therein complies with the standards respecting shipboard cargo gear as set forth in the Convention Concerning the Protection Against Accidents of Workers Employed in Loading or Unloading Ships (Revised) (International Labor Organization Convention No. 32); and,

(2) The dates when such tests or surveys were conducted, together with the signatures or initials of the competent persons performing them shall be recorded therein.

(b) This approval and permission to accept valid current certificates and/or registers of the National Cargo Bureau, Inc., shall become effective on the date of publication of this document in the Federal Register and shall be in effect until suspended, amended, or canceled by proper authority.

(CGFR 60–73, dated December 19, 1960, published December 24, 1960, 25 F.R. 13730, as amended by CGFR 61–44, dated November 17, 1961, published November 23, 1961, 26 F.R. 10996.)

ACCEPTANCE OF CERTIFICATES AND/OR REGISTERS ISSUED BY UNIVERSAL CARGO GEAR SURVEY AND CERTIFICATION BUREAU, INC.

By virtue of the authority vested in me as Commandant, United States Coast Guard, by Treasury Department Orders 120, dated July 31, 1950 (15 F.R. 6521), 167–14, dated November 26, 1954 (19 F.R. 8026), 167–20, dated June 18, 1956 (21 F.R. 4894), CGFR 56–28, dated July 24, 1956 (21 F.R. 5659), and 167–38, dated October 26, 1959 (24 F.R. 8857), and the applicable inspection laws administered in conjunction with R.S. 4405, as amended, 4462, as amended (46 U.S.C. 375, 416), and the regulations in 46 CFR 31.10–16, 71.25–25 and 91.25–25: *It is ordered*, That:

(a) The valid current certificates and/or registers issued by the Universal Cargo Gear Survey and Certification Bureau, Inc., with home office at 149 Broadway, New York, New York, 10006, attesting to the tests and surveys of shipboard cargo gear on a passenger, cargo, or miscellaneous vessel conducted by or for such Bureau, may be accepted as prima facie evidence of the condition and suitability of such gear by the Coast Guard when performing an inspection of a vessel as further described in 46 CFR 31.10–16, 71.25–25 or 91.25–25: *Provided*, That:

(1) Such certificates and/or registers shall be maintained currently and shall indicate that the described shipboard cargo gear for the particular vessel described therein complies with the standards respecting shipboard cargo gear as set forth in the Convention Concerning the Protection Against Accidents of Workers Employed in Loading or Unloading Ships (Revised) (International Labor Organization Convention No. 32); and,

(2) The dates when such tests or surveys were conducted, together with the signatures or initials of the competent persons performing them shall be recorded therein.

(b) This approval and permission to accept valid current certificates and/or registers of the Universal Cargo Gear Survey and Certification Bureau, Inc., shall become effective on the date of publication of this document in the Federal Register and shall be in effect until suspended, amended, or canceled by proper authority.

(CGFR 60–76, dated November 9, 1960, published November 17, 1960, 25 F.R. 10950, as amended by CGFR 61–44, dated November 17, 1961, published November 23, 1961, 26 F.R. 10996.)

NOTICE OF CONTINUATION OR ORDERS, RULES, REGULATIONS, POLICIES, PROCEDURES, PRIVILEGES, WAIVERS, AND OTHER ACTIONS

On April 1, 1967, the Department of Transportation Act, Public Law 89–670, became effective. In 49 CFR Part 1, the Secretary of Transportation delegated certain authority to the Commandant of the Coast Guard. Pursuant to the authority delegated to the Commandant in that part, subject to the reservations therein, and in accordance with the provisions of section 12(a) of the Department of Transportation Act, all orders, determinations, rules, regulations, directives, requirements, standards, statements of policy, notices, interpretations, procedures, documents, registers, licenses, enrollments, certifications, permits, privileges, exemptions, committees and councils and appointments thereto, contracts, agreements, waivers, and all other actions which have been issued, made, granted, or allowed to become effective prior to April 1, 1967, under the provisions of law listed below are hereby adopted and affirmed and shall continue in effect according to their terms until modified, terminated, repealed, superseded, or set aside by appropriate authority:

(1) Section 6(a)(4) of the Department of Transportation Act relating generally to functions

under the Great Lakes Pilotage Act of 1960, as amended (74 Stat. 259, 46 U.S.C. 216 et seq.).

(2) Section 6(b)(1) of the Department of Transportation Act relating generally to functions, powers, and duties of the Coast Guard concerned primarily with merchant marine safety, law enforcement, search and rescue activities, merchant vessel documentation and registration, aids to navigation, and military readiness.

(3) Section 6(g) (except for section 6(g)(4) of the Department of Transportation Act relating generally to water vessel anchorages, drawbridge operating regulations, obstructive bridges, pollution of the sea by oil, and the locations and clearances of bridges and causeways over the navigable waters of the United States under the following laws:

(a) Section 7 of the Act of March 4, 1915, as amended (38 Stat. 1053, 33 U.S.C. 471);

(b) Article 11 of section 1 of the Act of June 7, 1897, as amended (30 Stat. 98, 33 U.S.C. 180);

(c) Rule 9 of section 1 of the Act of February 8, 1895, as amended (28 Stat. 647, 33 U.S.C. 258);

(d) Rule numbered 13 of section 4233 of the Revised Statutes, as amended (33 U.S.C. 322);

(e) Section 5 of the Act of August 18, 1894, as amended (28 Stat. 362, 33 U.S.C. 499);

(f) The Act of June 21, 1940, as amended (54 Stat. 497, 33 U.S.C. 511 et seq.);

(g) The Oil Pollution Act, 1961, as amended (75 Stat. 402, 33 U.S.C. 1001 et seq.);

(h) Section 9 of the Act of March 3, 1899, as amended (30 Stat. 1151, 33 U.S.C. 401);

(i) The Act of March 23, 1906, as amended (34 Stat. 84, 33 U.S.C. 491 et seq.); and

(j) The General Bridge Act of 1946, as amended (60 Stat. 847, 33 U.S.C. 525 et seq.) except section 503.

All forms and stationery authorized for use, immediately prior to the effective date of the Act, relating to the functions, powers, and duties of the Coast Guard or delegated to the Commandant under 49 CFR Part 1, are hereby adopted by the Commandant and may be used to conduct the official business of the Coast Guard until the present supply has been exhausted. Any such form or stationery which is intended for use by or with the public shall be appropriately revised where required to reflect the transfer of the Coast Guard to the Department of Transportation. Existing forms and stationery will not be used and new supplies will be promptly procured in each case where the necessary revision would exceed the utility of the form or stationery.

Communications dealing with the functions, powers, and duties under the Great Lakes Pilotage Act of 1960, or relating generally to functions, powers, and duties described in subparagraph (3) above, shall be addressed to the Commandant (CCS), U.S. Coast Guard Headquarters, 1300 E Street NW., Washington, D.C. 20591.

Communications relating generally to functions, powers, and duties of the Coast Guard as listed in subparagraph (2) above should be addressed where indicated by currently effective regulations found in Titles 33 and 46 of the Code of Federal Regulations.

This order is effective April 1, 1967.

(CGFR 67-22 dated March 31, 1967, published April 5, 1967, 32 F.R. 5611)

CHANGES MADE IN TEXT SINCE LAST EDITION

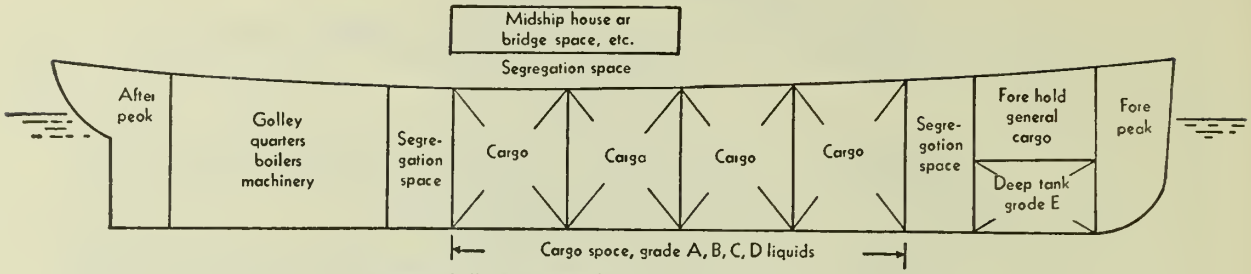
46 CFR SUBCHAPTER D

Federal Register, December 6, 1966, Vol. 31, No. 235, page 15264.
Federal Register, April 5, 1967, Vol. 32, No. 65, page 5611.
Federal Register, December 9, 1967, Vol. 32, No. 238, page 17621.
Federal Register, December 27, 1967, Vol. 32, No. 249, page 20814.
Federal Register, January 26, 1968, Vol. 33, No. 18, page 1014.
Federal Register, January 27, 1968, Vol. 33, No. 19, page 1106.
Federal Register, February 10, 1968, Vol. 33, No. 29, page 2846.
Federal Register, April 12, 1968, Vol. 33, No. 72, page 5708.
Federal Register, June 1, 1968, Vol. 33, No. 107, page 8226.
Federal Register, October 2, 1968, Vol. 33, No. 192, page 14703.
Federal Register, December 18, 1968, Vol. 33, No. 245, page 18804.
Federal Register, December 28, 1968, Vol. 33, No. 252, page 19982.

COAST GUARD DISTRICT COMMANDERS AND MERCHANT MARINE ACTIVITIES

District	Title	City	State	Address
1st	Commander, 1st Coast Guard District	Boston	Massachusetts 02203	J. F. Kennedy Federal Bldg., Government Center.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	Massachusetts 02109	427 Commercial St.
	do	Portland	Maine 04112	P.O. Box 108, Pearl Street Station.
	do	Providence	Rhode Island 02903	104 Customhouse
2d	Commander, 2d Coast Guard District	St. Louis	Missouri 63103	Federal Bldg., 1520 Market St.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	Missouri 63102	Suite 1210, 208 N. Broadway.
	do	Cairo	Illinois 62914	P.O. Box 391.
	do	Dubuque	Iowa 52001	Box 695.
	do	Cincinnati	Ohio 45202	4020 Federal Office Bldg., 550 Main St.
	do	Louisville	Kentucky 40202	254 Francis Bldg., 4th and Chestnut Sts.
	do	Memphis	Tennessee 38103	856 Federal Bldg., 167 No. Main St.
	do	Nashville	Tennessee 37203	670 U.S. Court House, 801 Broadway.
	do	Pittsburgh	Pennsylvania 15219	1032 U.S. Post Office and Courthouse Bldg.
	do	Huntington	West Virginia 25701	328 Post Office and Federal Court House Bldg., 5th Ave. and 9th St.
3d	Commander, 3d Coast Guard District	New York	New York 10004	Governors Island.
	Chief Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Battery Park Bldg.
	do	Albany	New York 12207	313 Federal Bldg.
	do	Philadelphia	Pennsylvania 19106	Customhouse.
5th	Commander, 5th Coast Guard District	Portsmouth	Virginia 23705	Federal Bldg., 431 Crawford St.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	200 Federal Bldg.
	do	Wilmington	North Carolina 28401.	Room 101 Federal Bldg.
	do	Baltimore	Maryland 21202	Customhouse.
7th	Commander, 7th Coast Guard District	Miami	Florida 33130	1018 Federal Bldg., 51 SW. 1st Ave.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	Florida 33132	501 NE. 1st Ave.
	do	Tampa	Florida 33601	Room 210, 500 Zack St., P.O. Box 3172.
	do	Charleston	South Carolina 29403	625 Federal Bldg., 334 Meeting St.
	do	Savannah	Georgia 31402	P.O. Box 8191.
	do	Jacksonville	Florida 32202	Room 552, 400 W. Bay St., Box 35064.
	do	San Juan	Puerto Rico 00904	302 Federal Bldg., P.O. Box 3666.
8th	Commander, 8th Coast Guard District	New Orleans	Louisiana 70130	Customhouse.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	201 Gateway Bldg., 124 Camp St.
	do	Mobile	Alabama 36602	563 Federal Bldg.
	do	Port Arthur	Texas 77640	Federal Bldg. Customhouse 5th and Austin Ave.
	do	Galveston	Texas 77550	234 Customhouse.
	do	Corpus Christi	Texas 78403	P.O. Box 1621, 723 N. Upper Broadway.
	do	Houston	Texas 77011	7300 Wingate St.
9th	Commander, 9th Coast Guard District	Cleveland	Ohio 44199	1240 East 9th St.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	Ohio 44114	1055 East 9th St.
	do	Buffalo	New York 14203	440 Federal Bldg., 121 Ellicott St.
	do	Oswego	New York 13126	208 Federal Bldg.
	do	Detroit	Michigan 48226	424 Federal and Courthouse Bldg.
	do	Duluth	Minnesota 55802	Canal Park
	do	Toledo	Ohio 43604	5101 Federal Bldg., 234 Summit St.
	do	Saint Ignace	Michigan 49781	Municipal Bldg.
	do	Chicago	Illinois 60617	10101 S. Ewing Ave.
	do	Ludington	Michigan 49431	P.O. Box 308.
	do	Milwaukee	Wisconsin 53203	Room 400, 135 W. Wells St.
11th	Commander, 11th Coast Guard District	Long Beach	California 90802	Heartwell Bldg., 19 Pine Ave.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	San Pedro	California 90731	(Los Angeles-Long Beach) 2035 Customhouse, 300 S. Ferry St.
	do	San Diego	California 92101	Room 12A B. St. Pier.
12th	Commander, 12th Coast Guard District	San Francisco	California 94126	630 Sansome St.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Station B, Box 2029.
13th	Commander, 13th Coast Guard District	Seattle	Washington 98104	618 2d Ave.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Do.
	do	Portland	Oregon 97209	496 Federal Bldg., 511 NW. Broadway.
14th	Commander, 14th Coast Guard District	Honolulu	Hawaii 96813	677 Ala Moana.
	Chief, Merchant Marine Safety Division	do	Hawaii 96813	610 Fort St.
	Officer in Charge, Marine Inspection	do	do	Do.
	do	Guam		Marianas.
17th	Commander, 17th Coast Guard District	Juneau	Alaska 99801	P.O. Box 3-5000.
	Chief, Merchant Marine Safety Division	do	do	Do.
	Officer in Charge, Marine Inspection	do	do	Do.
	do	Anchorage	Alaska 99501	P.O. Box 1286.

Merchant marine details	Local addresses
LONDON	Commander, Coast Guard Activities, Europe Staff Box 5, 7, North Audley Street, London, W.1, England.
BREMEN	Merchant Marine Detail Officer, USCG American Consulate General, 1, Praesident Kennedy Platz, BREMEN, Germany.
NAPLES	Merchant Marine Detail Officer, USCG American Consulate General, Piazza Principe di Napoli, NAPLES, Italy.
ROTTERDAM	Merchant Marine Detail Officer, USCG American Consulate General, Vlasmarkt 1, ROTTERDAM, Netherlands.
YOKOHAMA	Merchant Marine Detail Officer, USCG North Pier, YOKOHAMA, Japan.
SAIGON	Merchant Marine Detail Officer, USCG American Embassy 4 Thong Nhut Saigon, Viet Nam



Cargo tanks carrying grade A, B, C, or D liquids shall be segregated from the following spaces:

1. Galleys.
2. Living quarters.
3. General cargo spaces.
4. Boiler rooms.
5. Enclosed spaces containing propelling machinery or other machinery normally a source of vapor ignition.

For the purposes of this rule, the following are considered segregating spaces:

1. Cofferdams.
2. Pump rooms.
3. Empty tanks.
4. Tanks containing grade E liquids.

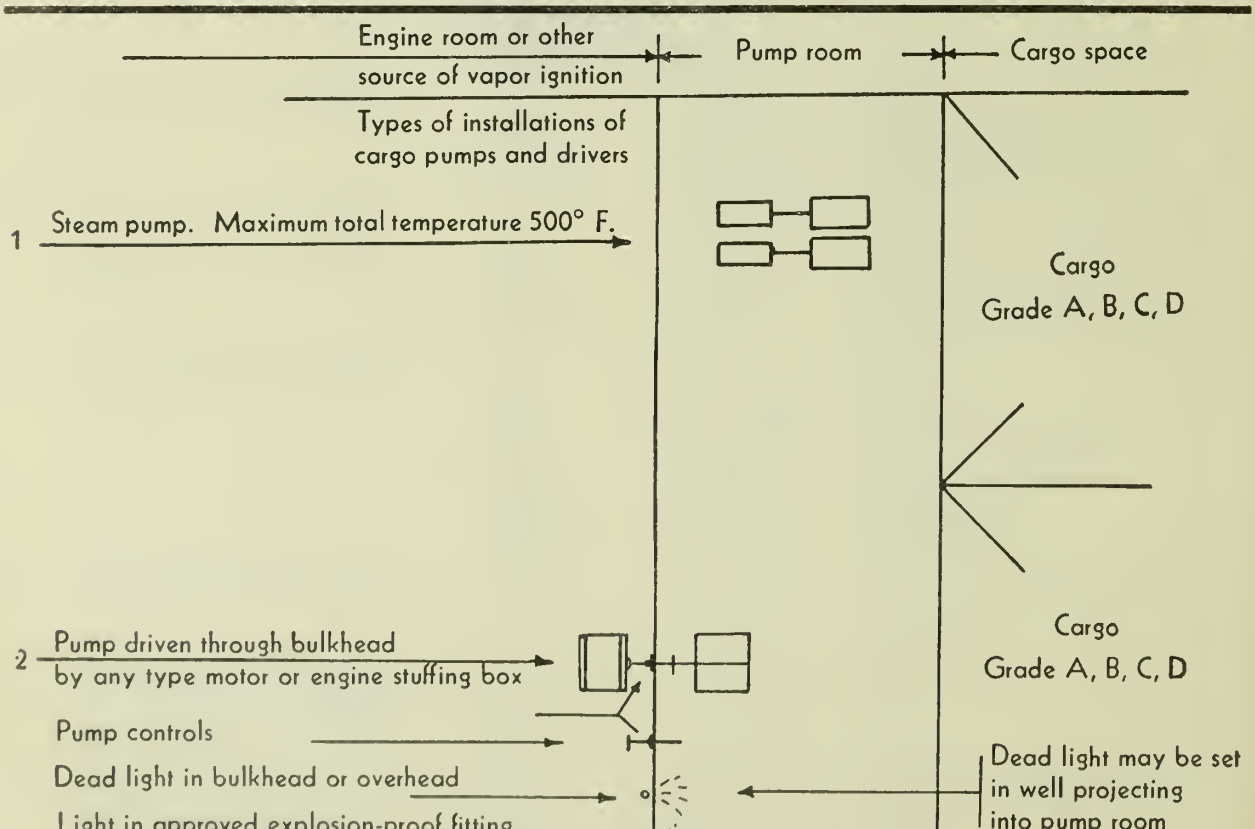
Segregation spaces may be vertical or horizontal.

Segregation for steel tank vessels contracted for prior to November 10, 1936, when carrying grade A, B, or C liquids, shall meet requirements for tank vessels constructed between November 10, 1936, and July 1, 1951, regarding vertical segregation spaces with the following exceptions:

1. No segregation is required between fore hold and cargo space.
2. No segregation is required between cargo space and pump engine room meeting specifications of rule.

No horizontal segregation space is required between deck house and cargo space.

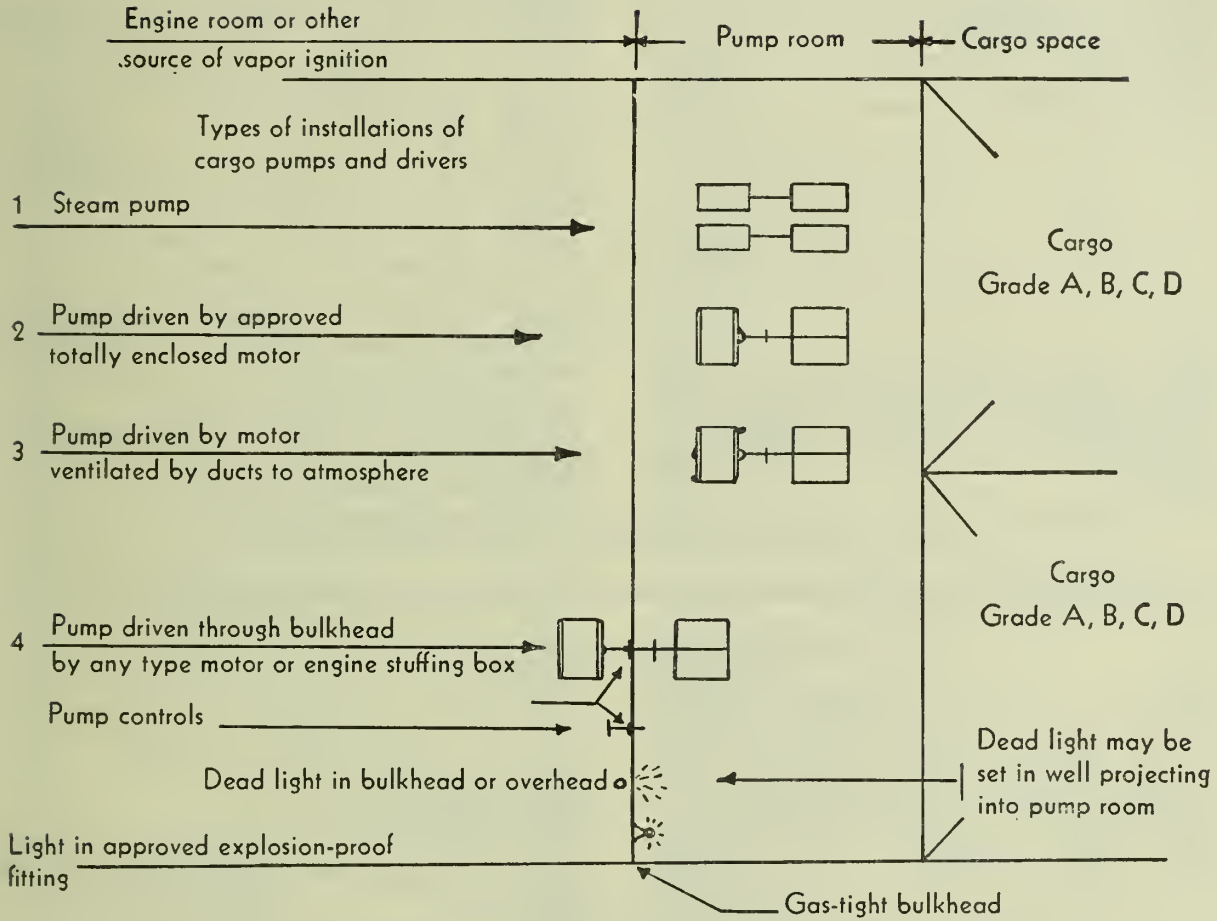
U. S. Coast Guard Drawing No. 1.—Illustrating Sections 32.60–10, 32.65–15, and 32.70–10; Segregation of cargo on steel tank vessels (revised February 1951).


Engine room or other source of vapor ignition
Pump room
Cargo space
Types of installations of cargo pumps and drivers
1 Steam pump. Maximum total temperature 500° F.
Cargo
Grade A, B, C, D
2 Pump driven through bulkhead by any type motor or engine stuffing box
Pump controls
Dead light in bulkhead or overhead
Light in approved explosion-proof fitting
Cargo
Grade A, B, C, D
Dead light may be set in well projecting into pump room
Gas-tight bulkhead

1. Steam pumps where maximum total temperature does not exceed 500° F. are not considered sources of vapor ignition.

2. Any other type of driver must be separated from pump room by gas-tight bulkhead as shown in No. 2.

U. S. Coast Guard Drawing No. 2.—Illustrating Section 32.60–20; Pump rooms for new tank vessels constructed on or after July 1, 1951 (February 1951).

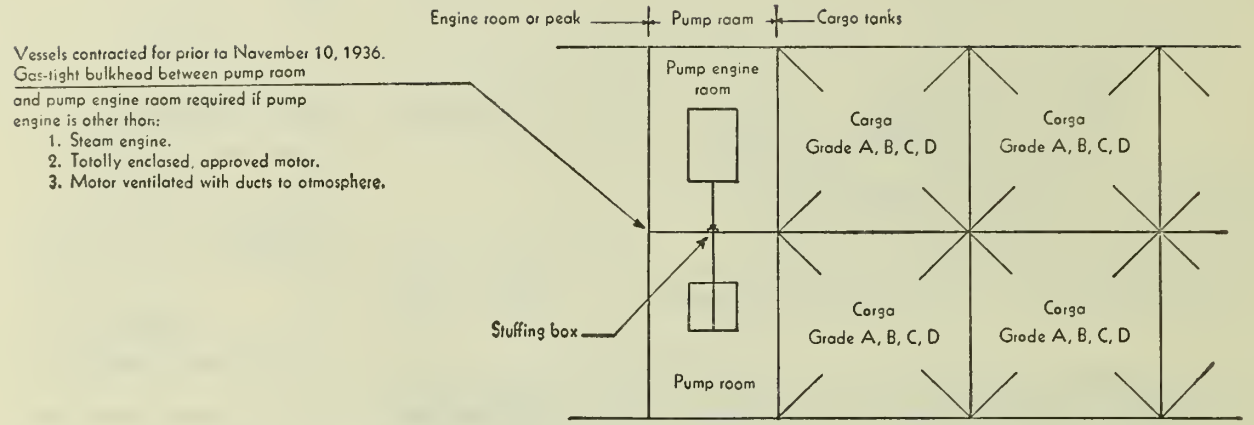

Engine room or other source of vapor ignition
Pump room
Cargo space
Types of installations of cargo pumps and drivers
1 Steam pump
2 Pump driven by approved totally enclosed motor
3 Pump driven by motor ventilated by ducts to atmosphere
4 Pump driven through bulkhead by any type motor or engine stuffing box
Pump controls
Dead light in bulkhead or overhead
Light in approved explosion-proof fitting
Cargo Grade A, B, C, D
Cargo Grade A, B, C, D
Dead light may be set in well projecting into pump room
Gas-tight bulkhead

Types 1, 2, and 3 are not considered sources of vapor ignition and may be installed in pump room.

Any other type of driver must be separated from pump room by gas-tight bulkhead as shown in Drawing No. 4.

For steel tank vessels contracted for prior to November 10, 1936, see exception in Section 32.70–20, illustrated in Drawing No. 4.

U. S. Coast Guard Drawing No. 3.—Illustrating Section 32.65–20; Pump rooms for tank vessels constructed prior to July 1, 1951 (February 1951).

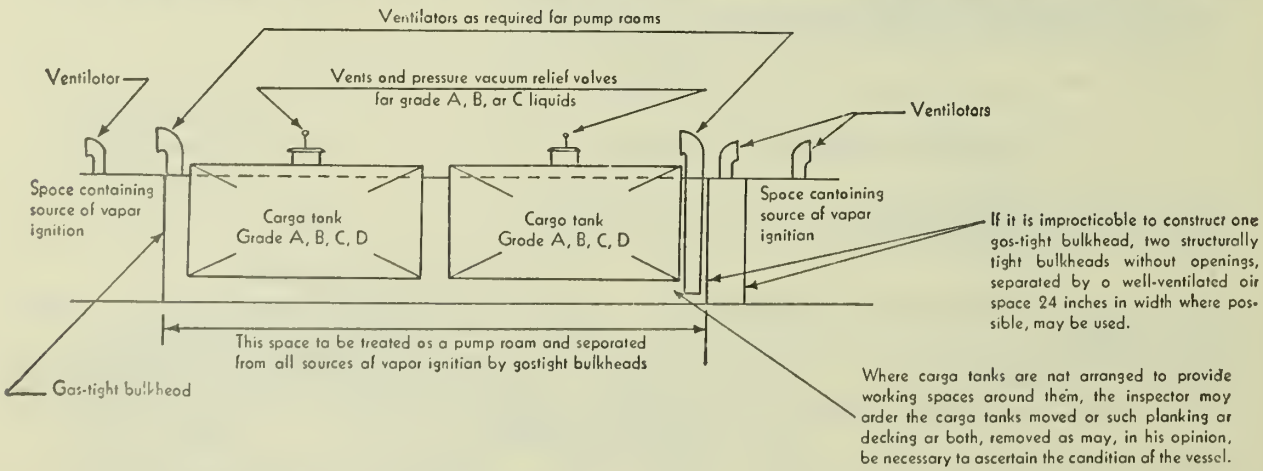

Engine room or peak
Pump room
Cargo tanks
Vessels contracted for prior to November 10, 1936.
Gas-tight bulkhead between pump room and pump engine room required if pump engine is other than:
1. Steam engine.
2. Totally enclosed, approved motor.
3. Motor ventilated with ducts to atmosphere.
Pump engine room
Cargo Grade A, B, C, D
Cargo Grade A, B, C, D
Stuffing box
Cargo Grade A, B, C, D
Cargo Grade A, B, C, D
Pump room

On steel tank vessels contracted for prior to November 10, 1936, no cofferdam is required between cargo tanks and pump engine room if either of the following 2 conditions is satisfied:

1. Pump engine not source of vapor ignition. See drawing 3.
2. Protection against vapor ignition provided by meeting all the following requirements:

(A) Pump engine used exclusively for pumping operations.
(B) Pump engine room contains no cargo valves.
(C) Pump engine room well ventilated.
(D) Pump engine exhausts within room completely waterjacketed or insulated.
(E) Gasoline engine intakes fitted with flame arresters.

U. S. Coast Guard Drawing No. 4.—Illustrating Sections 32.70–15 and 32.70–20; Pump engine rooms for steel tank vessels constructed prior to November 10, 1936 (February 1951).


Ventilators as required for pump rooms
Ventilator
Vents and pressure vacuum relief valves for grade A, B, or C liquids
Ventilators
Space containing source of vapor ignition
Cargo tank Grade A, B, C, D
Cargo tank Grade A, B, C, D
Space containing source of vapor ignition
If it is impracticable to construct one gas-tight bulkhead, two structurally tight bulkheads without openings, separated by a well-ventilated air space 24 inches in width where possible, may be used.
This space to be treated as a pump room and separated from all sources of vapor ignition by gastight bulkheads
Gas-tight bulkhead
Where cargo tanks are not arranged to provide working spaces around them, the inspector may order the cargo tanks moved or such planking or decking or both, removed as may, in his opinion, be necessary to ascertain the condition of the vessel.

U. S. Coast Guard Drawing No. 5.—Illustrating Sections 32.75–10 and 32.75–20; Hold spaces and bulkheads for wood hull tank vessels (February 1951).

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